KAISER·HILL
COMPANY

Data Summary Report
IHSS Group 900-3

August 2003

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ACRONYMS

AL	action level
AR	Administrative Record
CDPHE	Colorado Department of Public Health and Environment
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
DOE	U.S. Department of Energy
DQA	Data Quality Assessment
DQO	Data Quality Objective
EPA	U.S. Environmental Protection Agency
ER	Environmental Restoration
ER	RSOP Environmental Restoration RFCA Standard Operating Procedure
HPGe	high-purity germanium detector
IA	Industrial Area
IASAP	Industrial Area Sampling and Analysis Plan
IHSS	Individual Hazardous Substance Site
K-H	Kaiser-Hill Company L.L.C.
MARSSIM	Multi-Agency Radiation Survey and Site Investigation Manual
mg/kg	milligram per kilogram
N/A	not applicable
ND	not detected
PAC	Potential Area of Concern
PARCCS	precision, accuracy, representativeness, completeness, comparability, and sensitivity
pCi/g	picocurie per gram
POC	Point of Compliance
RCRA	Resource Conservation and Recovery Act
RFCA	Rocky Flats Cleanup Agreement
RFETS	Rocky Flats Environmental Technology Site
RIN	report identification number
RL	reporting limit
SAP	Sampling and Analysis Plan
SD	standard deviation
SEP	Solar Evaporation Ponds
SOR	sum of ratio
SVOC	semi-volatile organic compound
ug/kg	microgram per kilogram
VOC	volatile organic compound
V&V	verification and validation

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1.0 INTRODUCTION

This data summary report summarizes characterization activities conducted at Individual Hazardous Substance Site (IHSS) Group 900-3 (Figure 1) at the Rocky Flats Environmental Technology Site (RFETS) in Golden, Colorado. Characterization activities were planned and executed in accordance with the Industrial Area Sampling and Analysis Plan (IASAP) (DOE 2001a) and IASAP Addendum #IA-03-01 (DOE 2002a).

2.0 SITE CHARACTERIZATION

IHSS Group 900-3 information consists of historical knowledge (DOE 1992-2001) and 43 sampling locations with specifications as described in IASAP Addendum #IA-03-01 (DOE 2002a). The sampling specifications for the characterization samples collected are listed in Table 1. The location of these samples and analytical results greater than background means plus two standard deviations or reporting limits is presented in Figure 2 and Table 2. A summary of the analytical results is presented in Table 3. Radionuclide Sum of Ratio (SOR) values are summarized in Table 4. Deviations from planned sampling specifications are presented in Table 5. The raw data, as of June 18, 2003, are enclosed on a compact disc.

Analytical results indicate that No Further Accelerated Action (NFAA) for IHSS Group 900-3 is warranted for the following reasons:

- All but one of the contaminants of concern (COCs) concentrations are less than proposed Rocky Flats Cleanup Agreement (RFCA) Wildlife Refuge Worker (WRW) Action Levels (ALs) (DOE, et al 2002b). An exception includes a single arsenic value (23.7 mg/kg) in surface soil that slightly exceeded the corresponding WRW AL (22.2 mg/kg) and background level (10.09 mg/kg);

- All but one of the COCs are less than RFCA Ecological Receptor ALs (ERAL) (DOE et al 2002b). An exception includes one occurrence of lead in surface soil (56.6 mg/kg) that exceeded the corresponding ERAL (25.6 mg/kg); and

- There is no identified potential to exceed surface water standards at a Point of Compliance (POC) from this IHSS Group.

Approval of this Data Summary Report constitutes regulatory agency concurrence of this IHSS Group as an NFAA. This information and NFAA determination will be documented in the FY03 Historical Release Report (HRR).

2.1 Analytical Results

Several analytes including metals, radionuclides, volatile organic compounds (VOCs), and polycyclic aromatic hydrocarbons (PAHs) were detected above background levels or laboratory reporting limits (RLs) at the majority of the sampling locations (Figure 2).

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As shown in Figure 2, a single arsenic value (23.7 mg/kg) located north of the 904-Pad, exceeds the corresponding WRW AL (22.2 mk/kg). The magnitude of the exceedance is slightly greater than the corresponding background level (10.09 mg/kg).

A single lead occurrence (56.6 mg/kg) in surface soil, located north of the 904-Pad, exceeds the ERAL but is only slightly greater than the background level (54.62 mg/kg). Although this lead observation exceeds the ERAL, it is two orders of magnitude less than the corresponding WRW AL (1,000 mg/kg).

Because arsenic and lead ALs are only slightly greater than background, it is likely that these metal exceedances above ALs are due to natural variation in soil rather than a contaminant release. Also of note is the absence of associated COCs above ALs. For example, no other metals, radionuclides, or VOCs exceed ALs.

2.2 Sum of Ratios

Sum of ratio (SOR) calculations are based on accelerated action analytical data for the radionuclides of concern (americium-241, plutonium-239/240, uranium-234, uranium-235, and uranium-238). As shown in Table 4, none of the radionuclide SOR values exceeded one. Therefore, no remedial or management actions are triggered.

3.0 DEVIATIONS FROM PLANNED SAMPLING SPECIFICATIONS

Deviations from the planned sampling specifications described in IASAP Addendum #IA-03-01 (DOE 2002a) are presented in Table 5.

THIS TARGET SHEET REPRESENTS AN OVER-SIZED MAP / PLATE FOR THIS DOCUMENT

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Figure 2: Surface Soil Sample Results Above Background Means Plus Two Standard Deviations or MDLs at IHSS Group 900-3

July 2003

U.S. DEPARTEMENT OF ENERGY
ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

GOLDEN, COLORADO

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IA-A-001622

Table 1
IHSS Group 900-3 Characterization Sampling Specifications

IHSS Group	IHSS/PAC/UBC Site	Location Code	Easting	Northing	Depth Interval[1]	Analyte	Laboratory Method
900-3	900-213	CL37-000	2085116.92	748829.83	0-0.5	Metals	6200
						Radionuclides	HPGe
						VOCs	8260
						Cyanide	SW9010B/SW9012A
						Nitrate as N	SW9056/E300.0
		CL37-001	2085108.21	748940.14	0-0.5	Metals	6200
						Radionuclides	HPGe
						VOCs	8260
						Cyanide	SW9010B/SW9012A
						Nitrate as N	SW9056/E300.0
		CL38-000	2085109.33	749041.67	0-0.5	Metals	6200
						Radionuclides	HPGe
						VOCs	8260
						Cyanide	SW9010B/SW9012A
						Nitrate as N	SW9056/E300.0
		CL39-000	2085107.09	749162.13	0-0.5	Metals	6200
						Radionuclides	HPGe
						VOCs	8260
						Cyanide	SW9010B/SW9012A
						Nitrate as N	SW9056/E300.0
		CM37-003	2085202.28	748819.05	0.3-0.8	Metals	6200
						Radionuclides	HPGe
						VOCs	8260
						Cyanide	SW9010B/SW9012A
						Nitrate as N	SW9056/E300.0
		CM37-005	2085139.72	748854.70	0-0.5	Metals	6200
						Radionuclides	HPGe
						VOCs	8260
						Cyanide	SW9010B/SW9012A

IHSS Group	IHSS/PAC/UBC Site	Location Code	Easting	Northing	Depth Interval[1]	Analyte	Laboratory Method
900-3	900-213	CM37-005	2085139.72	748854.70	0-0.5	Nitrate as N	SW9056/E300.0
		CM37-012	2085319.92	748823.27	0-0.5	Metals	6200
						Radionuclides	HPGe
						VOCs	8260
						Cyanide	SW9010B/SW9012A
						Nitrate as N	SW9056/E300.0
		CM37-014	2085264.42	748855.40	0.5-1	Metals	6200
						Radionuclides	HPGe
						VOCs	8260
						Cyanide	SW9010B/SW9012A
						Nitrate as N	SW9056/E300.0
		CM37-016	2085201.87	748891.05	0.3-0.8	Metals	6200
						Radionuclides	HPGe
						VOCs	8260
						Cyanide	SW9010B/SW9012A
						Nitrate as N	SW9056/E300.0
		CM37-018	2085139.31	748926.69	0-0.5	Metals	6200
						Radionuclides	HPGe
						VOCs	8260
						Cyanide	SW9010B/SW9012A
						Nitrate as N	SW9056/E300.0
		CM37-025	2085324.13	748887.90	0-0.5	Metals	6200
						Radionuclides	HPGe
						VOCs	8260
						Nitrate as N	SW9056/E300.0
						Cyanide	SW9010B/SW9012A
		CM37-027	2085264.01	748927.41	0.5-1	Metals	6200
						Radionuclides	HPGe
						VOCs	8260
						Cyanide	SW9010B/SW9012A
						Nitrate as N	SW9056/E300.0

IHSS Group	IHSS/PAC/UBC Site	Location Code	Easting	Northing	Depth Interval[1]	Analyte	Laboratory Method
900-3	900-213	CM37-031	2085322.33	748766.19	0-0.5	Metals	6200
						Radionuclides	HPGe
						VOCs	8260
						Cyanide	SW9010B/SW9012A
						Nitrate as N	SW9056/E300.0
		CM37-032	2085200.75	748769.60	0-0.5	Metals	6200
						Radionuclides	HPGe
						VOCs	8260
						Cyanide	SW9010B/SW9012A
						Nitrate as N	SW9056/E300.0
		CM38-001	2085201.46	748963.05	0.3-0.8	Metals	6200
						Radionuclides	HPGe
						VOCs	8260
						Cyanide	SW9010B/SW9012A
						Nitrate as N	SW9056/E300.0
		CM38-003	2085138.82	748998.80	0.25-0.67	Metals	6200
						Radionuclides	HPGe
						VOCs	8260
						Nitrate as N	SW9056/E300.0
						Cyanide	SW9010B/SW9012A
		CM38-009	2085326.16	748963.78	0-0.5	Metals	6200
						Radionuclides	HPGe
						VOCs	8260
						Cyanide	SW9010B/SW9012A
						Nitrate as N	SW9056/E300.0
		CM38-011	2085263.60	748999.40	0.5-1	Metals	6200
						Radionuclides	HPGe
						VOCs	8260
						Cyanide	SW9010B/SW9012A
						Nitrate as N	SW9056/E300.0
		CM38-013	2085201.01	749035.04	0.3-0.8	Metals	6200

IHSS Group	IHSS/PAC/UBC Site	Location Code	Easting	Northing	Depth Interval[1]	Analyte	Laboratory Method
900-3	900-213	CM38-013	2085201.01	749035.04	0.3-0.8	Radionuclides	HPGe
						VOCs	8260
						Cyanide	SW9010B/SW9012A
						Nitrate as N	SW9056/E300.0
		CM38-015	2085138.48	749070.78	0.33-0.75	Metals	6200
						Radionuclides	HPGe
						VOCs	8260
						Cyanide	SW9010B/SW9012A
						Nitrate as N	SW9056/E300.0
		CM38-023	2085325.75	749035.78	0-0.5	Metals	6200
						Radionuclides	HPGe
						VOCs	8260
						Cyanide	SW9010B/SW9012A
						Nitrate as N	SW9056/E300.0
		CM38-025	2085263.18	749071.46	0.5-1	Metals	6200
						Radionuclides	HPGe
						VOCs	8260
						Cyanide	SW9010B/SW9012A
						Nitrate as N	SW9056/E300.0
		CM38-027	2085200.69	749107.08	0.3-0.8	Metals	6200
						Radionuclides	HPGe
						VOCs	8260
						Cyanide	SW9010B/SW9012A
						Nitrate as N	SW9056/E300.0
		CM38-029	2085138.11	749142.68	0.5-1	Metals	6200
						Radionuclides	HPGe
						VOCs	8260
						Nitrate as N	SW9056/E300.0
						Cyanide	SW9010B/SW9012A
		CM38-036	2085325.34	749107.76	0-0.5	Metals	6200
						Radionuclides	HPGe

IHSS Group	IHSS/PAC/UBC Site	Location Code	Easting	Northing	Depth Interval[1]	Analyte	Laboratory Method
900-3	900-213	CM38-036	2085325.34	749107.76	0-0.5	VOCs	8260
						Cyanide	SW9010B/SW9012A
						Nitrate as N	SW9056/E300.0
		CM38-038	2085262.77	749143.42	0.5-1	Metals	6200
						Radionuclides	HPGe
						VOCs	8260
						Cyanide	SW9010B/SW9012A
						Nitrate as N	SW9056/E300.0
		CM39-001	2085200.19	749179.07	0.25-0.67	Metals	6200
						Radionuclides	HPGe
						VOCs	8260
						Cyanide	SW9010B/SW9012A
						Nitrate as N	SW9056/E300.0
		CM39-003	2085137.60	749214.67	0-0.5	Metals	6200
						Radionuclides	HPGe
						VOCs	8260
						Cyanide	SW9010B/SW9012A
						Nitrate as N	SW9056/E300.0
		CM39-008	2085324.91	749179.61	0-0.5	Metals	6200
						Radionuclides	HPGe
						VOCs	8260
						Cyanide	SW9010B/SW9012A
						Nitrate as N	SW9056/E300.0
		CM39-010	2085262.42	749215.37	0.5-1	Metals	6200
						Radionuclides	HPGe
						VOCs	8260
						Nitrate as N	SW9056/E300.0
						Cyanide	SW9010B/SW9012A
		CM39-012	2085169.56	749244.63	0-0.5	Metals	6200
						Radionuclides	HPGe
						VOCs	8260

IHSS Group	IHSS/PAC/UBC Site	Location Code	Easting	Northing	Depth Interval[1]	Analyte	Laboratory Method
900-3	900-213	CM39-012	2085169.56	749244.63	0-0.5	Cyanide	SW9010B/SW9012A
						Nitrate as N	SW9056/E300.0
		CM39-013	2085296.64	749246.81	0-0.5	Metals	6200
						Radionuclides	HPGe
						VOCs	8260
						Cyanide	SW9010B/SW9012A
						Nitrate as N	SW9056/E300.0
		CN37-003	2085389.13	748856.15	0-0.5	Metals	6200
						Radionuclides	HPGe
						VOCs	8260
						Cyanide	SW9010B/SW9012A
						Nitrate as N	SW9056/E300.0
		CN37-009	2085388.72	748928.11	0-0.5	Metals	6200
						Radionuclides	HPGe
						VOCs	8260
						Cyanide	SW9010B/SW9012A
						Nitrate as N	SW9056/E300.0
		CN37-012	2085427.69	748917.12	0-0.5	Metals	6200
						Radionuclides	HPGe
						VOCs	8260
						Cyanide	SW9010B/SW9012A
						Nitrate as N	SW9056/E300.0
		CN37-013	2085404.41	748811.76	0-0.5	Metals	6200
						Radionuclides	HPGe
						VOCs	8260
						Cyanide	SW9010B/SW9012A
						Nitrate as N	SW9056/E300.0
		CN38-003	2085388.31	749000.11	0-0.5	Metals	6200
						Radionuclides	HPGe
						VOCs	8260
						Cyanide	SW9010B/SW9012A

IHSS Group	IHSS/PAC/UBC Site	Location Code	Easting	Northing	Depth Interval[1]	Analyte	Laboratory Method
900-3	900-213	CN38-003	2085388.31	749000.11	0-0.5	Nitrate as N	SW9056/E300.0
		CN38-009	2085382.79	749072.30	0-0.5	Metals	6200
						Radionuclides	HPGe
						VOCs	8260
						Nitrate as N	SW9056/E300.0
						Cyanide	SW9010B/SW9012A
		CN38-015	2085387.48	749144.08	0-0.5	Metals	6200
						Radionuclides	HPGe
						VOCs	8260
						Cyanide	SW9010B/SW9012A
						Nitrate as N	SW9056/E300.0
		CN38-016	2085430.53	749116.01	0-0.5	Metals	6200
						Radionuclides	HPGe
						VOCs	8260
						Cyanide	SW9010B/SW9012A
						Nitrate as N	SW9056/E300.0
		CN38-017	2085428.68	749021.97	0-0.5	Metals	6200
						Radionuclides	HPGe
						VOCs	8260
						Cyanide	SW9010B/SW9012A
						Nitrate as N	SW9056/E300.0
		CN39-005	2085387.08	749216.11	0.5-1	Metals	6200
						Radionuclides	HPGe
						VOCs	8260
						Cyanide	SW9010B/SW9012A
						Nitrate as N	SW9056/E300.0
		CN39-006	2085436.05	749242.37	0-0.5	Metals	6200
						Radionuclides	HPGe
						VOCs	8260
						Nitrate as N	SW9056/E300.0
						Cyanide	SW9010B/SW9012A

[1] Depth Interval is based on the ground surface as the reference datum. Note that some samples begin at depths greater than 0 feet because of asphalt and/or artificial fill overlying native soil.

Table 2
Surface Soil Results Greater than Background Mean Plus Two Standard Deviations or Reporting Limits

Location	Easting	Northing	Analyte	Depth Start (feet)	Depth End (feet)	Result	Detection Limit	Wildlife Refuge Worker Action Level	Ecological Receptor Action Level	Background	Units
CL37-000	2085116.92	748829.83	ARSENIC	0	0.5	12.7	5	22.2	21.6	10.09	MG/KG
CL37-000	2085116.92	748829.83	BARIUM	0	0.5	624	98	26400	—	141.26	MG/KG
CL37-000	2085116.92	748829.83	CHROMIUM	0	0.5	32.1	20	268	—	16.99	MG/KG
CL37-000	2085116.92	748829.83	COPPER	0	0.5	155	4	40900	—	18.06	MG/KG
CL37-000	2085116.92	748829.83	IRON	0	0.5	34800	2190	307000	—	18037.00	MG/KG
CL37-000	2085116.92	748829.83	MANGANESE	0	0.5	613	158	3480	—	365.08	MG/KG
CL37-000	2085116.92	748829.83	NICKEL	0	0.5	50	12	20400	—	14.91	MG/KG
CL37-000	2085116.92	748829.83	STRONTIUM	0	0.5	241	20	613000	—	48.94	MG/KG
CL37-000	2085116.92	748829.83	VANADIUM	0	0.5	126	31	7150	292	45.59	MG/KG
CL37-000	2085116.92	748829.83	ZINC	0	0.5	165	9	307000	—	73.76	MG/KG
CL37-000	2085116.92	748829.83	U-235	0	0.5	0.19	0.13	8	1900	0.09	PCI/G
CL37-000	2085116.92	748829.83	U-238	0	0.5	4.02	1.82	351	1600	2.00	PCI/G
CL37-001	2085108.21	748940.14	ARSENIC	0	0.5	10.8	5	22.2	21.6	10.09	MG/KG
CL37-001	2085108.21	748940.14	BARIUM	0	0.5	744	98	26400	—	141.26	MG/KG
CL37-001	2085108.21	748940.14	CHROMIUM	0	0.5	38.3	20	268	—	16.99	MG/KG
CL37-001	2085108.21	748940.14	COPPER	0	0.5	126	4	40900	—	18.06	MG/KG
CL37-001	2085108.21	748940.14	IRON	0	0.5	31500	2190	307000	—	18037.00	MG/KG
CL37-001	2085108.21	748940.14	MANGANESE	0	0.5	523	158	3480	—	365.08	MG/KG
CL37-001	2085108.21	748940.14	NICKEL	0	0.5	45.9	12	20400	—	14.91	MG/KG
CL37-001	2085108.21	748940.14	STRONTIUM	0	0.5	252	20	613000	—	48.94	MG/KG
CL37-001	2085108.21	748940.14	VANADIUM	0	0.5	57.7	31	7150	292	45.59	MG/KG
CL37-001	2085108.21	748940.14	ZINC	0	0.5	122	9	307000	—	73.76	MG/KG
CL37-001	2085108.21	748940.14	U-235	0	0.5	0.18	0.13	8	1900	0.09	PCI/G
CL37-001	2085108.21	748940.14	U-238	0	0.5	2.89	1.92	351	1600	2.00	PCI/G
CL37-001	2085108.21	748940.14	NAPHTHALENE	0	0.5	1	5.1	3090000	—	NA	UG/KG

Location	Easting	Northing	Analyte	Depth Start (feet)	Depth End (feet)	Result	Detection Limit	Wildlife Refuge Worker Action Level	Ecological Receptor Action Level	Background	Units
CL37-001	2085108.21	748940.14	XYLENES (TOTAL)	0	0.5	7	10	1000000000	—	NA	UG/KG
CL38-000	2085109.33	749041.67	ARSENIC	0	0.5	16.9	5	22.2	21.6	10.09	MG/KG
CL38-000	2085109.33	749041.67	BARIUM	0	0.5	671	98	26400	—	141.26	MG/KG
CL38-000	2085109.33	749041.67	COPPER	0	0.5	153	4	40900	—	18.06	MG/KG
CL38-000	2085109.33	749041.67	IRON	0	0.5	28400	2190	307000	—	18037.00	MG/KG
CL38-000	2085109.33	749041.67	MANGANESE	0	0.5	431	158	3480	—	365.08	MG/KG
CL38-000	2085109.33	749041.67	NICKEL	0	0.5	43.4	12	20400	—	14.91	MG/KG
CL38-000	2085109.33	749041.67	STRONTIUM	0	0.5	307	20	613000	—	48.94	MG/KG
CL38-000	2085109.33	749041.67	VANADIUM	0	0.5	114	31	7150	292	45.59	MG/KG
CL38-000	2085109.33	749041.67	ZINC	0	0.5	115	9	307000	—	73.76	MG/KG
CL38-000	2085109.33	749041.67	U-235	0	0.5	0.21	0.13	8	1900	0.09	PCI/G
CL38-000	2085109.33	749041.67	U-238	0	0.5	2.91	1.78	351	1600	2.00	PCI/G
CL39-000	2085107.09	749162.13	ARSENIC	0	0.5	12.9	5	22.2	21.6	10.09	MG/KG
CL39-000	2085107.09	749162.13	BARIUM	0	0.5	624	98	26400	—	141.26	MG/KG
CL39-000	2085107.09	749162.13	CHROMIUM	0	0.5	33.1	20	268	—	16.99	MG/KG
CL39-000	2085107.09	749162.13	COPPER	0	0.5	160	4	40900	—	18.06	MG/KG
CL39-000	2085107.09	749162.13	IRON	0	0.5	48200	2190	307000	—	18037.00	MG/KG
CL39-000	2085107.09	749162.13	MANGANESE	0	0.5	1170	158	3480	—	365.08	MG/KG
CL39-000	2085107.09	749162.13	NICKEL	0	0.5	48.9	12	20400	—	14.91	MG/KG
CL39-000	2085107.09	749162.13	STRONTIUM	0	0.5	221	20	613000	—	48.94	MG/KG
CL39-000	2085107.09	749162.13	VANADIUM	0	0.5	119	31	7150	292	45.59	MG/KG
CL39-000	2085107.09	749162.13	ZINC	0	0.5	236	9	307000	—	73.76	MG/KG
CL39-000	2085107.09	749162.13	U-235	0	0.5	0.29	0.14	8	1900	0.09	PCI/G
CL39-000	2085107.09	749162.13	U-238	0	0.5	5.10	1.55	351	1600	2.00	PCI/G
CL39-000	2085107.09	749162.13	ACETONE	0	0.5	10	100	102000000	211000	NA	UG/KG
CL39-000	2085107.09	749162.13	ETHYLBENZENE	0	0.5	21	5.2	4250000	—	NA	UG/KG
CL39-000	2085107.09	749162.13	XYLENES (TOTAL)	0	0.5	170	10	1000000000	—	NA	UG/KG

Location	Easting	Northing	Analyte	Depth Start (feet)	Depth End (feet)	Result	Detection Limit	Wildlife Refuge Worker Action Level	Ecological Receptor Action Level	Background	Units
CM37-003	2085202.28	748819.05	ARSENIC	0.3	0.8	14.4	5	22.2	21.6	10.09	MG/KG
CM37-003	2085202.28	748819.05	BARIUM	0.3	0.8	749	98	26400	—	141.26	MG/KG
CM37-003	2085202.28	748819.05	CADMIUM	0.3	0.8	4.09	3	962	—	1.61	MG/KG
CM37-003	2085202.28	748819.05	CHROMIUM	0.3	0.8	34.2	20	268	—	16.99	MG/KG
CM37-003	2085202.28	748819.05	COPPER	0.3	0.8	122	4	40900	—	18.06	MG/KG
CM37-003	2085202.28	748819.05	IRON	0.3	0.8	44400	2190	307000	—	18037.00	MG/KG
CM37-003	2085202.28	748819.05	MANGANESE	0.3	0.8	1160	158	3480	—	365.08	MG/KG
CM37-003	2085202.28	748819.05	NICKEL	0.3	0.8	56.6	12	20400	—	14.91	MG/KG
CM37-003	2085202.28	748819.05	STRONTIUM	0.3	0.8	495	20	613000	—	48.94	MG/KG
CM37-003	2085202.28	748819.05	VANADIUM	0.3	0.8	96.2	31	7150	292	45.59	MG/KG
CM37-003	2085202.28	748819.05	ZINC	0.3	0.8	110	9	307000	—	73.76	MG/KG
CM37-003	2085202.28	748819.05	U-235	0.3	0.8	0.27	0.14	8	1900	0.09	PCI/G
CM37-003	2085202.28	748819.05	U-238	0.3	0.8	4.07	2.12	351	1600	2.00	PCI/G
CM37-003	2085202.28	748819.05	ACETONE	0.3	0.8	20	110	102000000	211000	NA	UG/KG
CM37-005	2085139.72	748854.7	BARIUM	0	0.5	901	98	26400	—	141.26	MG/KG
CM37-005	2085139.72	748854.7	CHROMIUM	0	0.5	56	20	268	—	16.99	MG/KG
CM37-005	2085139.72	748854.7	COPPER	0	0.5	145	4	40900	—	18.06	MG/KG
CM37-005	2085139.72	748854.7	IRON	0	0.5	52000	2190	307000	—	18037.00	MG/KG
CM37-005	2085139.72	748854.7	MANGANESE	0	0.5	1470	158	3480	—	365.08	MG/KG
CM37-005	2085139.72	748854.7	NICKEL	0	0.5	76.2	12	20400	—	14.91	MG/KG
CM37-005	2085139.72	748854.7	STRONTIUM	0	0.5	638	20	613000	—	48.94	MG/KG
CM37-005	2085139.72	748854.7	VANADIUM	0	0.5	96	31	7150	292	45.59	MG/KG
CM37-005	2085139.72	748854.7	ZINC	0	0.5	112	9	307000	—	73.76	MG/KG
CM37-005	2085139.72	748854.7	U-235	0	0.5	0.24	0.14	8	1900	0.09	PCI/G
CM37-005	2085139.72	748854.7	U-238	0	0.5	3.54	1.72	351	1600	2.00	PCI/G
CM37-005	2085139.72	748854.7	ACETONE	0	0.5	10	110	102000000	211000	NA	UG/KG
CM37-005	2085139.72	748854.7	NAPHTHALENE	0	0.5	0.9	5.4	3090000	—	NA	UG/KG

Location	Easting	Northing	Analyte	Depth Start (feet)	Depth End (feet)	Result	Detection Limit	Wildlife Refuge Worker Action Level	Ecological Receptor Action Level	Background	Units
CM37-012	2085319.92	748823.27	BARIUM	0	0.5	661	98	26400	—	141.26	MG/KG
CM37-012	2085319.92	748823.27	CHROMIUM	0	0.5	116	20	268	—	16.99	MG/KG
CM37-012	2085319.92	748823.27	COBALT	0	0.5	306	90	1550	—	10.91	MG/KG
CM37-012	2085319.92	748823.27	COPPER	0	0.5	214	4	40900	—	18.06	MG/KG
CM37-012	2085319.92	748823.27	IRON	0	0.5	56300	2190	307000	—	18037.00	MG/KG
CM37-012	2085319.92	748823.27	MANGANESE	0	0.5	1590	158	3480	—	365.08	MG/KG
CM37-012	2085319.92	748823.27	NICKEL	0	0.5	99	12	20400	—	14.91	MG/KG
CM37-012	2085319.92	748823.27	STRONTIUM	0	0.5	628	20	613000	—	48.94	MG/KG
CM37-012	2085319.92	748823.27	VANADIUM	0	0.5	100	31	7150	292	45.59	MG/KG
CM37-012	2085319.92	748823.27	ZINC	0	0.5	121	9	307000	—	73.76	MG/KG
CM37-012	2085319.92	748823.27	U-235	0	0.5	0.33	0.12	8	1900	0.09	PCI/G
CM37-012	2085319.92	748823.27	U-238	0	0.5	4.43	1.75	351	1600	2.00	PCI/G
CM37-012	2085319.92	748823.27	NAPHTHALENE	0	0.5	1.7	5.2	3090000	—	NA	UG/KG
CM37-014	2085264.42	748855.4	BARIUM	0.5	1	922	98	26400	—	141.26	MG/KG
CM37-014	2085264.42	748855.4	CADMIUM	0.5	1	3.09	3	962	—	1.61	MG/KG
CM37-014	2085264.42	748855.4	CHROMIUM	0.5	1	53.8	20	268	—	16.99	MG/KG
CM37-014	2085264.42	748855.4	COPPER	0.5	1	140	4	40900	—	18.06	MG/KG
CM37-014	2085264.42	748855.4	IRON	0.5	1	57600	2190	307000	—	18037.00	MG/KG
CM37-014	2085264.42	748855.4	MANGANESE	0.5	1	1610	158	3480	—	365.08	MG/KG
CM37-014	2085264.42	748855.4	NICKEL	0.5	1	66.7	12	20400	—	14.91	MG/KG
CM37-014	2085264.42	748855.4	STRONTIUM	0.5	1	718	20	613000	—	48.94	MG/KG
CM37-014	2085264.42	748855.4	VANADIUM	0.5	1	143	31	7150	292	45.59	MG/KG
CM37-014	2085264.42	748855.4	ZINC	0.5	1	130	9	307000	—	73.76	MG/KG
CM37-016	2085201.87	748891.05	ARSENIC	0.3	0.8	11.8	5	22.2	21.6	10.09	MG/KG
CM37-016	2085201.87	748891.05	BARIUM	0.3	0.8	888	98	26400	—	141.26	MG/KG
CM37-016	2085201.87	748891.05	CHROMIUM	0.3	0.8	37.4	20	268	—	16.99	MG/KG

Location	Easting	Northing	Analyte	Depth Start (feet)	Depth End (feet)	Result	Detection Limit	Wildlife Refuge Worker Action Level	Ecological Receptor Action Level	Background	Units
CM37-016	2085201.87	748891.05	COPPER	0.3	0.8	158	4	40900	—	18.06	MG/KG
CM37-016	2085201.87	748891.05	IRON	0.3	0.8	45300	2190	307000	—	18037.00	MG/KG
CM37-016	2085201.87	748891.05	MANGANESE	0.3	0.8	1240	158	3480	—	365.08	MG/KG
CM37-016	2085201.87	748891.05	NICKEL	0.3	0.8	58.3	12	20400	—	14.91	MG/KG
CM37-016	2085201.87	748891.05	STRONTIUM	0.3	0.8	514	20	613000	—	48.94	MG/KG
CM37-016	2085201.87	748891.05	VANADIUM	0.3	0.8	95.6	31	7150	292	45.59	MG/KG
CM37-016	2085201.87	748891.05	ZINC	0.3	0.8	122	9	307000	—	73.76	MG/KG
CM37-016	2085201.87	748891.05	ACETONE	0.3	0.8	10	110	102000000	211000	NA	UG/KG
CM37-016	2085201.87	748891.05	NAPHTHALENE	0.3	0.8	1	5.3	3090000	—	NA	UG/KG
CM37-018	2085139.31	748926.69	BARIUM	0	0.5	799	98	26400	—	141.26	MG/KG
CM37-018	2085139.31	748926.69	CHROMIUM	0	0.5	33	20	268	—	16.99	MG/KG
CM37-018	2085139.31	748926.69	COPPER	0	0.5	192	4	40900	—	18.06	MG/KG
CM37-018	2085139.31	748926.69	IRON	0	0.5	45400	2190	307000	—	18037.00	MG/KG
CM37-018	2085139.31	748926.69	MANGANESE	0	0.5	1320	158	3480	—	365.08	MG/KG
CM37-018	2085139.31	748926.69	NICKEL	0	0.5	56.1	12	20400	—	14.91	MG/KG
CM37-018	2085139.31	748926.69	STRONTIUM	0	0.5	513	20	613000	—	48.94	MG/KG
CM37-018	2085139.31	748926.69	VANADIUM	0	0.5	114	31	7150	292	45.59	MG/KG
CM37-018	2085139.31	748926.69	ZINC	0	0.5	125	9	307000	—	73.76	MG/KG
CM37-018	2085139.31	748926.69	U-235	0	0.5	0.22	0.13	8	1900	0.09	PCI/G
CM37-018	2085139.31	748926.69	U-238	0	0.5	2.00	1.56	351	1600	2.00	PCI/G
CM37-018	2085139.31	748926.69	ACETONE	0	0.5	15	110	102000000	211000	NA	UG/KG
CM37-025	2085324.13	748887.9	BARIUM	0	0.5	876	98	26400	—	141.26	MG/KG
CM37-025	2085324.13	748887.9	CHROMIUM	0	0.5	72	20	268	—	16.99	MG/KG
CM37-025	2085324.13	748887.9	COBALT	0	0.5	215	90	1550	—	10.91	MG/KG
CM37-025	2085324.13	748887.9	COPPER	0	0.5	197	4	40900	—	18.06	MG/KG
CM37-025	2085324.13	748887.9	IRON	0	0.5	58000	2190	307000	—	18037.00	MG/KG

Location	Easting	Northing	Analyte	Depth Start (feet)	Depth End (feet)	Result	Detection Limit	Wildlife Refuge Worker Action Level	Ecological Receptor Action Level	Background	Units
CM37-025	2085324.13	748887.9	MANGANESE	0	0.5	1840	158	3480	—	365.08	MG/KG
CM37-025	2085324.13	748887.9	NICKEL	0	0.5	92	12	20400	—	14.91	MG/KG
CM37-025	2085324.13	748887.9	STRONTIUM	0	0.5	705	20	613000	—	48.94	MG/KG
CM37-025	2085324.13	748887.9	VANADIUM	0	0.5	128	31	7150	292	45.59	MG/KG
CM37-025	2085324.13	748887.9	ZINC	0	0.5	125	9	307000	—	73.76	MG/KG
CM37-025	2085324.13	748887.9	U-238	0	0.5	3.39	1.83	351	1600	2.00	PCI/G
CM37-027	2085264.01	748927.41	BARIUM	0.5	1	878	98	26400	—	141.26	MG/KG
CM37-027	2085264.01	748927.41	CHROMIUM	0.5	1	55.6	20	268	—	16.99	MG/KG
CM37-027	2085264.01	748927.41	COPPER	0.5	1	114	4	40900	—	18.06	MG/KG
CM37-027	2085264.01	748927.41	IRON	0.5	1	50500	2190	307000	—	18037.00	MG/KG
CM37-027	2085264.01	748927.41	MANGANESE	0.5	1	1370	158	3480	—	365.08	MG/KG
CM37-027	2085264.01	748927.41	NICKEL	0.5	1	58.7	12	20400	—	14.91	MG/KG
CM37-027	2085264.01	748927.41	STRONTIUM	0.5	1	541	20	613000	—	48.94	MG/KG
CM37-027	2085264.01	748927.41	VANADIUM	0.5	1	149	31	7150	292	45.59	MG/KG
CM37-027	2085264.01	748927.41	ZINC	0.5	1	104	9	307000	—	73.76	MG/KG
CM37-027	2085264.01	748927.41	U-235	0.5	1	0.18	0.12	8	1900	0.09	PCI/G
CM37-027	2085264.01	748927.41	U-238	0.5	1	2.32	2.00	351	1600	2.00	PCI/G
CM37-027	2085264.01	748927.41	ACETONE	0.5	1	30	110	102000000	211000	NA	UG/KG
CM37-031	2085322.33	748766.19	ARSENIC	0	0.5	17.6	5	22.2	21.6	10.09	MG/KG
CM37-031	2085322.33	748766.19	BARIUM	0	0.5	727	98	26400	—	141.26	MG/KG
CM37-031	2085322.33	748766.19	CHROMIUM	0	0.5	43.3	20	268	—	16.99	MG/KG
CM37-031	2085322.33	748766.19	COPPER	0	0.5	135	4	40900	—	18.06	MG/KG
CM37-031	2085322.33	748766.19	IRON	0	0.5	37400	2190	307000	—	18037.00	MG/KG
CM37-031	2085322.33	748766.19	MANGANESE	0	0.5	630	158	3480	—	365.08	MG/KG
CM37-031	2085322.33	748766.19	NICKEL	0	0.5	53.2	12	20400	—	14.91	MG/KG
CM37-031	2085322.33	748766.19	STRONTIUM	0	0.5	261	20	613000	—	48.94	MG/KG
CM37-031	2085322.33	748766.19	VANADIUM	0	0.5	98.4	31	7150	292	45.59	MG/KG

Location	Easting	Northing	Analyte	Depth Start (feet)	Depth End (feet)	Result	Detection Limit	Wildlife Refuge Worker Action Level	Ecological Receptor Action Level	Background	Units
CM37-031	2085322.33	748766.19	ZINC	0	0.5	197	9	307000	—	73.76	MG/KG
CM37-031	2085322.33	748766.19	U-238	0	0.5	2.77	1.39	351	1600	2.00	PCI/G
CM37-031	2085322.33	748766.19	ETHYLBENZENE	0	0.5	9	5.6	4250000	—	NA	UG/KG
CM37-031	2085322.33	748766.19	XYLENES (TOTAL)	0	0.5	68	11	1000000000	—	NA	UG/KG
CM37-032	2085200.75	748769.6	ARSENIC	0	0.5	17.8	5	22.2	21.6	10.09	MG/KG
CM37-032	2085200.75	748769.6	BARIUM	0	0.5	613	98	26400	—	141.26	MG/KG
CM37-032	2085200.75	748769.6	CHROMIUM	0	0.5	28.6	20	268	—	16.99	MG/KG
CM37-032	2085200.75	748769.6	COPPER	0	0.5	150	4	40900	—	18.06	MG/KG
CM37-032	2085200.75	748769.6	IRON	0	0.5	31900	2190	307000	—	18037.00	MG/KG
CM37-032	2085200.75	748769.6	MANGANESE	0	0.5	457	158	3480	—	365.08	MG/KG
CM37-032	2085200.75	748769.6	NICKEL	0	0.5	55.4	12	20400	—	14.91	MG/KG
CM37-032	2085200.75	748769.6	STRONTIUM	0	0.5	224	20	613000	—	48.94	MG/KG
CM37-032	2085200.75	748769.6	VANADIUM	0	0.5	113	31	7150	292	45.59	MG/KG
CM37-032	2085200.75	748769.6	ZINC	0	0.5	126	9	307000	—	73.76	MG/KG
CM37-032	2085200.75	748769.6	U-235	0	0.5	0.25	0.13	8	1900	0.09	PCI/G
CM37-032	2085200.75	748769.6	U-238	0	0.5	3.05	1.89	351	1600	2.00	PCI/G
CM37-032	2085200.75	748769.6	XYLENES (TOTAL)	0	0.5	6	10	1000000000	—	NA	UG/KG
CM38-001	2085201.46	748963.05	ARSENIC	0.3	0.8	12.6	5	22.2	21.6	10.09	MG/KG
CM38-001	2085201.46	748963.05	BARIUM	0.3	0.8	743	98	26400	—	141.26	MG/KG
CM38-001	2085201.46	748963.05	CHROMIUM	0.3	0.8	62.3	20	268	—	16.99	MG/KG
CM38-001	2085201.46	748963.05	COPPER	0.3	0.8	163	4	40900	—	18.06	MG/KG
CM38-001	2085201.46	748963.05	IRON	0.3	0.8	49800	2190	307000	—	18037.00	MG/KG
CM38-001	2085201.46	748963.05	MANGANESE	0.3	0.8	1180	158	3480	—	365.08	MG/KG
CM38-001	2085201.46	748963.05	NICKEL	0.3	0.8	80.5	12	20400	—	14.91	MG/KG
CM38-001	2085201.46	748963.05	STRONTIUM	0.3	0.8	552	20	613000	—	48.94	MG/KG
CM38-001	2085201.46	748963.05	VANADIUM	0.3	0.8	120	31	7150	292	45.59	MG/KG

Location	Easting	Northing	Analyte	Depth Start (feet)	Depth End (feet)	Result	Detection Limit	Wildlife Refuge Worker Action Level	Ecological Receptor Action Level	Background	Units
CM38-001	2085201.46	748963.05	ZINC	0.3	0.8	119	9	307000	—	73.76	MG/KG
CM38-001	2085201.46	748963.05	U-235	0.3	0.8	0.24	0.16	8	1900	0.09	PCI/G
CM38-001	2085201.46	748963.05	U-238	0.3	0.8	2.59	1.65	351	1600	2.00	PCI/G
CM38-001	2085201.46	748963.05	ACETONE	0.3	0.8	20	110	102000000	211000	NA	UG/KG
CM38-003	2085138.82	748998.8	ARSENIC	0.25	0.67	12.9	5	22.2	21.6	10.09	MG/KG
CM38-003	2085138.82	748998.8	BARIUM	0.25	0.67	601	98	26400	—	141.26	MG/KG
CM38-003	2085138.82	748998.8	CHROMIUM	0.25	0.67	34.9	20	268	—	16.99	MG/KG
CM38-003	2085138.82	748998.8	COPPER	0.25	0.67	128	4	40900	—	18.06	MG/KG
CM38-003	2085138.82	748998.8	IRON	0.25	0.67	35500	2190	307000	—	18037.00	MG/KG
CM38-003	2085138.82	748998.8	MANGANESE	0.25	0.67	953	158	3480	—	365.08	MG/KG
CM38-003	2085138.82	748998.8	NICKEL	0.25	0.67	46	12	20400	—	14.91	MG/KG
CM38-003	2085138.82	748998.8	STRONTIUM	0.25	0.67	380	20	613000	—	48.94	MG/KG
CM38-003	2085138.82	748998.8	VANADIUM	0.25	0.67	71.9	31	7150	292	45.59	MG/KG
CM38-003	2085138.82	748998.8	ZINC	0.25	0.67	103	9	307000	—	73.76	MG/KG
CM38-009	2085326.16	748963.78	BARIUM	0	0.5	795	98	26400	—	141.26	MG/KG
CM38-009	2085326.16	748963.78	CHROMIUM	0	0.5	99.3	20	268	—	16.99	MG/KG
CM38-009	2085326.16	748963.78	COBALT	0	0.5	285	90	1550	—	10.91	MG/KG
CM38-009	2085326.16	748963.78	COPPER	0	0.5	214	4	40900	—	18.06	MG/KG
CM38-009	2085326.16	748963.78	IRON	0	0.5	59700	2190	307000	—	18037.00	MG/KG
CM38-009	2085326.16	748963.78	MANGANESE	0	0.5	1870	158	3480	—	365.08	MG/KG
CM38-009	2085326.16	748963.78	NICKEL	0	0.5	94.2	12	20400	—	14.91	MG/KG
CM38-009	2085326.16	748963.78	STRONTIUM	0	0.5	650	20	613000	—	48.94	MG/KG
CM38-009	2085326.16	748963.78	VANADIUM	0	0.5	87.8	31	7150	292	45.59	MG/KG
CM38-009	2085326.16	748963.78	ZINC	0	0.5	137	9	307000	—	73.76	MG/KG
CM38-009	2085326.16	748963.78	U-235	0	0.5	0.29	0.12	8	1900	0.09	PCI/G
CM38-009	2085326.16	748963.78	U-238	0	0.5	6.50	1.68	351	1600	2.00	PCI/G
CM38-011	2085263.6	748999.4	BARIUM	0.5	1	680	98	26400	—	141.26	MG/KG

Location	Easting	Northing	Analyte	Depth Start (feet)	Depth End (feet)	Result	Detection Limit	Wildlife Refuge Worker Action Level	Ecological Receptor Action Level	Background	Units
CM38-011	2085263.6	748999.4	CHROMIUM	0.5	1	45.6	20	268	—	16.99	MG/KG
CM38-011	2085263.6	748999.4	COPPER	0.5	1	118	4	40900	—	18.06	MG/KG
CM38-011	2085263.6	748999.4	IRON	0.5	1	39500	2190	307000	—	18037.00	MG/KG
CM38-011	2085263.6	748999.4	MANGANESE	0.5	1	988	158	3480	—	365.08	MG/KG
CM38-011	2085263.6	748999.4	NICKEL	0.5	1	50.3	12	20400	—	14.91	MG/KG
CM38-011	2085263.6	748999.4	STRONTIUM	0.5	1	424	20	613000	—	48.94	MG/KG
CM38-011	2085263.6	748999.4	VANADIUM	0.5	1	89.6	31	7150	292	45.59	MG/KG
CM38-011	2085263.6	748999.4	ZINC	0.5	1	103	9	307000	—	73.76	MG/KG
CM38-011	2085263.6	748999.4	U-238	0.5	1	6.25	1.49	351	1600	2.00	PCI/G
CM38-013	2085201.01	749035.04	ARSENIC	0.3	0.8	14.1	5	22.2	21.6	10.09	MG/KG
CM38-013	2085201.01	749035.04	BARIUM	0.3	0.8	706	98	26400	—	141.26	MG/KG
CM38-013	2085201.01	749035.04	CHROMIUM	0.3	0.8	30.9	20	268	—	16.99	MG/KG
CM38-013	2085201.01	749035.04	COPPER	0.3	0.8	137	4	40900	—	18.06	MG/KG
CM38-013	2085201.01	749035.04	IRON	0.3	0.8	33400	2190	307000	—	18037.00	MG/KG
CM38-013	2085201.01	749035.04	MANGANESE	0.3	0.8	651	158	3480	—	365.08	MG/KG
CM38-013	2085201.01	749035.04	NICKEL	0.3	0.8	50.5	12	20400	—	14.91	MG/KG
CM38-013	2085201.01	749035.04	STRONTIUM	0.3	0.8	297	20	613000	—	48.94	MG/KG
CM38-013	2085201.01	749035.04	VANADIUM	0.3	0.8	82.2	31	7150	292	45.59	MG/KG
CM38-013	2085201.01	749035.04	ZINC	0.3	0.8	105	9	307000	—	73.76	MG/KG
CM38-013	2085201.01	749035.04	U-238	0.3	0.8	3.39	1.96	351	1600	2.00	PCI/G
CM38-013	2085201.01	749035.04	2-BUTANONE	0.3	0.8	19	110	192000000	433000	NA	UG/KG
CM38-013	2085201.01	749035.04	ACETONE	0.3	0.8	83	110	102000000	211000	NA	UG/KG
CM38-015	2085138.48	749070.78	BARIUM	0.33	0.75	355	98	26400	—	141.26	MG/KG
CM38-015	2085138.48	749070.78	CHROMIUM	0.33	0.75	26.3	20	268	—	16.99	MG/KG
CM38-015	2085138.48	749070.78	COPPER	0.33	0.75	42.9	4	40900	—	18.06	MG/KG
CM38-015	2085138.48	749070.78	IRON	0.33	0.75	21200	2190	307000	—	18037.00	MG/KG

Location	Easting	Northing	Analyte	Depth Start (feet)	Depth End (feet)	Result	Detection Limit	Wildlife Refuge Worker Action Level	Ecological Receptor Action Level	Background	Units
CM38-015	2085138.48	749070.78	NICKEL	0.33	0.75	33.4	12	20400	—	14.91	MG/KG
CM38-015	2085138.48	749070.78	STRONTIUM	0.33	0.75	183	20	613000	—	48.94	MG/KG
CM38-015	2085138.48	749070.78	VANADIUM	0.33	0.75	70.9	31	7150	292	45.59	MG/KG
CM38-015	2085138.48	749070.78	U-235	0.33	0.75	0.25	0.18	8	1900	0.09	PCI/G
CM38-015	2085138.48	749070.78	U-238	0.33	0.75	2.91	1.88	351	1600	2.00	PCI/G
CM38-015	2085138.48	749070.78	ACETONE	0.33	0.75	50	120	102000000	211000	NA	UG/KG
CM38-023	2085325.75	749035.78	ARSENIC	0	0.5	18.7	5	22.2	21.6	10.09	MG/KG
CM38-023	2085325.75	749035.78	BARIUM	0	0.5	612	98	26400	—	141.26	MG/KG
CM38-023	2085325.75	749035.78	CHROMIUM	0	0.5	84.9	20	268	—	16.99	MG/KG
CM38-023	2085325.75	749035.78	COBALT	0	0.5	189	90	1550	—	10.91	MG/KG
CM38-023	2085325.75	749035.78	COPPER	0	0.5	198	4	40900	—	18.06	MG/KG
CM38-023	2085325.75	749035.78	IRON	0	0.5	39600	2190	307000	—	18037.00	MG/KG
CM38-023	2085325.75	749035.78	MANGANESE	0	0.5	626	158	3480	—	365.08	MG/KG
CM38-023	2085325.75	749035.78	NICKEL	0	0.5	60.4	12	20400	—	14.91	MG/KG
CM38-023	2085325.75	749035.78	STRONTIUM	0	0.5	242	20	613000	—	48.94	MG/KG
CM38-023	2085325.75	749035.78	VANADIUM	0	0.5	119	31	7150	292	45.59	MG/KG
CM38-023	2085325.75	749035.78	ZINC	0	0.5	136	9	307000	—	73.76	MG/KG
CM38-023	2085325.75	749035.78	U-235	0	0.5	0.23	0.12	8	1900	0.09	PCI/G
CM38-023	2085325.75	749035.78	U-238	0	0.5	4.72	1.53	351	1600	2.00	PCI/G
CM38-025	2085263.18	749071.46	BARIUM	0.5	1	493	98	26400	—	141.26	MG/KG
CM38-025	2085263.18	749071.46	CHROMIUM	0.5	1	29.3	20	268	—	16.99	MG/KG
CM38-025	2085263.18	749071.46	COPPER	0.5	1	104	4	40900	—	18.06	MG/KG
CM38-025	2085263.18	749071.46	IRON	0.5	1	24500	2190	307000	—	18037.00	MG/KG
CM38-025	2085263.18	749071.46	MANGANESE	0.5	1	391	158	3480	—	365.08	MG/KG
CM38-025	2085263.18	749071.46	NICKEL	0.5	1	32.8	12	20400	—	14.91	MG/KG
CM38-025	2085263.18	749071.46	STRONTIUM	0.5	1	145	20	613000	—	48.94	MG/KG
CM38-025	2085263.18	749071.46	VANADIUM	0.5	1	91.5	31	7150	292	45.59	MG/KG

Location	Easting	Northing	Analyte	Depth Start (feet)	Depth End (feet)	Result	Detection Limit	Wildlife Refuge Worker Action Level	Ecological Receptor Action Level	Background	Units
CM38-025	2085263.18	749071.46	ZINC	0.5	1	83.7	9	307000	—	73.76	MG/KG
CM38-025	2085263.18	749071.46	AM-241[1]	0.5	1	4.96	0.37	76	1900	0.02	PCI/G
CM38-025	2085263.18	749071.46	PU-239/240[1]	0.5	1	6.64	N/A	50	3800	0.07	PCI/G
CM38-025	2085263.18	749071.46	U-235	0.5	1	0.26	0.14	8	1900	0.09	PCI/G
CM38-025	2085263.18	749071.46	U-238	0.5	1	3.28	1.52	351	1600	2.00	PCI/G
CM38-025	2085263.18	749071.46	ACETONE	0.5	1	80	110	102000000	211000	NA	UG/KG
CM38-027	2085200.69	749107.08	BARIUM	0.3	0.8	483	98	26400	—	141.26	MG/KG
CM38-027	2085200.69	749107.08	CHROMIUM	0.3	0.8	24.5	20	268	—	16.99	MG/KG
CM38-027	2085200.69	749107.08	COPPER	0.3	0.8	135	4	40900	—	18.06	MG/KG
CM38-027	2085200.69	749107.08	IRON	0.3	0.8	25700	2190	307000	—	18037.00	MG/KG
CM38-027	2085200.69	749107.08	MANGANESE	0.3	0.8	571	158	3480	—	365.08	MG/KG
CM38-027	2085200.69	749107.08	NICKEL	0.3	0.8	45.1	12	20400	—	14.91	MG/KG
CM38-027	2085200.69	749107.08	STRONTIUM	0.3	0.8	350	20	613000	—	48.94	MG/KG
CM38-027	2085200.69	749107.08	VANADIUM	0.3	0.8	71.9	31	7150	292	45.59	MG/KG
CM38-027	2085200.69	749107.08	ZINC	0.3	0.8	83.1	9	307000	—	73.76	MG/KG
CM38-027	2085200.69	749107.08	U-235	0.3	0.8	0.21	0.13	8	1900	0.09	PCI/G
CM38-027	2085200.69	749107.08	U-238	0.3	0.8	3.03	1.93	351	1600	2.00	PCI/G
CM38-027	2085200.69	749107.08	ACETONE	0.3	0.8	22	110	102000000	211000	NA	UG/KG
CM38-029	2085138.11	749142.68	ARSENIC	0.5	1	12.8	5	22.2	21.6	10.09	MG/KG
CM38-029	2085138.11	749142.68	BARIUM	0.5	1	595	98	26400	—	141.26	MG/KG
CM38-029	2085138.11	749142.68	CHROMIUM	0.5	1	41.7	20	268	—	16.99	MG/KG
CM38-029	2085138.11	749142.68	COPPER	0.5	1	94.8	4	40900	—	18.06	MG/KG
CM38-029	2085138.11	749142.68	IRON	0.5	1	30900	2190	307000	—	18037.00	MG/KG
CM38-029	2085138.11	749142.68	MANGANESE	0.5	1	553	158	3480	—	365.08	MG/KG
CM38-029	2085138.11	749142.68	NICKEL	0.5	1	39.5	12	20400	—	14.91	MG/KG
CM38-029	2085138.11	749142.68	STRONTIUM	0.5	1	225	20	613000	—	48.94	MG/KG
CM38-029	2085138.11	749142.68	VANADIUM	0.5	1	133	31	7150	292	45.59	MG/KG

Location	Easting	Northing	Analyte	Depth Start (feet)	Depth End (feet)	Result	Detection Limit	Wildlife Refuge Worker Action Level	Ecological Receptor Action Level	Background	Units
CM38-029	2085138.11	749142.68	ZINC	0.5	1	105	9	307000	—	73.76	MG/KG
CM38-029	2085138.11	749142.68	U-238	0.5	1	2.55	1.23	351	1600	2.00	PCI/G
CM38-029	2085138.11	749142.68	2-BUTANONE	0.5	1	23	110	192000000	433000	NA	UG/KG
CM38-029	2085138.11	749142.68	ACETONE	0.5	1	100	110	102000000	211000	NA	UG/KG
CM38-036	2085325.34	749107.76	ARSENIC	0	0.5	10.4	5	22.2	21.6	10.09	MG/KG
CM38-036	2085325.34	749107.76	BARIUM	0	0.5	638	98	26400	—	141.26	MG/KG
CM38-036	2085325.34	749107.76	CHROMIUM	0	0.5	57.9	20	268	—	16.99	MG/KG
CM38-036	2085325.34	749107.76	COBALT	0	0.5	259	90	1550	—	10.91	MG/KG
CM38-036	2085325.34	749107.76	COPPER	0	0.5	82.1	4	40900	—	18.06	MG/KG
CM38-036	2085325.34	749107.76	IRON	0	0.5	28800	2190	307000	—	18037.00	MG/KG
CM38-036	2085325.34	749107.76	MANGANESE	0	0.5	1040	158	3480	—	365.08	MG/KG
CM38-036	2085325.34	749107.76	NICKEL	0	0.5	58.5	12	20400	—	14.91	MG/KG
CM38-036	2085325.34	749107.76	STRONTIUM	0	0.5	290	20	613000	—	48.94	MG/KG
CM38-036	2085325.34	749107.76	VANADIUM	0	0.5	124	31	7150	292	45.59	MG/KG
CM38-036	2085325.34	749107.76	U-238	0	0.5	2.72	1.90	351	1600	2.00	PCI/G
CM38-038	2085262.77	749143.42	BARIUM	0.5	1	432	98	26400	—	141.26	MG/KG
CM38-038	2085262.77	749143.42	COPPER	0.5	1	116	4	40900	—	18.06	MG/KG
CM38-038	2085262.77	749143.42	NICKEL	0.5	1	47.6	12	20400	—	14.91	MG/KG
CM38-038	2085262.77	749143.42	STRONTIUM	0.5	1	247	20	613000	—	48.94	MG/KG
CM38-038	2085262.77	749143.42	U-235	0.5	1	0.24	0.16	8	1900	0.09	PCI/G
CM38-038	2085262.77	749143.42	U-238	0.5	1	5.09	2.20	351	1600	2.00	PCI/G
CM38-038	2085262.77	749143.42	2-BUTANONE	0.5	1	20	120	192000000	433000	NA	UG/KG
CM38-038	2085262.77	749143.42	ACETONE	0.5	1	100	120	102000000	211000	NA	UG/KG
CM39-001	2085200.19	749179.07	ARSENIC	0.25	0.67	11.5	5	22.2	21.6	10.09	MG/KG
CM39-001	2085200.19	749179.07	BARIUM	0.25	0.67	755	98	26400	—	141.26	MG/KG
CM39-001	2085200.19	749179.07	CHROMIUM	0.25	0.67	56.5	20	268	—	16.99	MG/KG
CM39-001	2085200.19	749179.07	COPPER	0.25	0.67	137	4	40900	—	18.06	MG/KG

Location	Easting	Northing	Analyte	Depth Start (feet)	Depth End (feet)	Result	Detection Limit	Wildlife Refuge Worker Action Level	Ecological Receptor Action Level	Background	Units
CM39-001	2085200.19	749179.07	IRON	0.25	0.67	44900	2190	307000	—	18037.00	MG/KG
CM39-001	2085200.19	749179.07	MANGANESE	0.25	0.67	1030	158	3480	—	365.08	MG/KG
CM39-001	2085200.19	749179.07	NICKEL	0.25	0.67	52.4	12	20400	—	14.91	MG/KG
CM39-001	2085200.19	749179.07	STRONTIUM	0.25	0.67	453	20	613000	—	48.94	MG/KG
CM39-001	2085200.19	749179.07	VANADIUM	0.25	0.67	132	31	7150	292	45.59	MG/KG
CM39-001	2085200.19	749179.07	ZINC	0.25	0.67	105	9	307000	—	73.76	MG/KG
CM39-001	2085200.19	749179.07	U-235	0.25	0.67	0.14	0.11	8	1900	0.09	PCI/G
CM39-001	2085200.19	749179.07	U-238	0.25	0.67	3.34	1.64	351	1600	2.00	PCI/G
CM39-001	2085200.19	749179.07	ACETONE	0.25	0.67	60	110	102000000	211000	NA	UG/KG
CM39-003	2085137.6	749214.67	ARSENIC	0	0.5	12.3	5	22.2	21.6	10.09	MG/KG
CM39-003	2085137.6	749214.67	BARIUM	0	0.5	746	98	26400	—	141.26	MG/KG
CM39-003	2085137.6	749214.67	CHROMIUM	0	0.5	43	20	268	—	16.99	MG/KG
CM39-003	2085137.6	749214.67	COPPER	0	0.5	127	4	40900	—	18.06	MG/KG
CM39-003	2085137.6	749214.67	IRON	0	0.5	41500	2190	307000	—	18037.00	MG/KG
CM39-003	2085137.6	749214.67	MANGANESE	0	0.5	974	158	3480	—	365.08	MG/KG
CM39-003	2085137.6	749214.67	NICKEL	0	0.5	54.6	12	20400	—	14.91	MG/KG
CM39-003	2085137.6	749214.67	STRONTIUM	0	0.5	410	20	613000	—	48.94	MG/KG
CM39-003	2085137.6	749214.67	VANADIUM	0	0.5	144	31	7150	292	45.59	MG/KG
CM39-003	2085137.6	749214.67	ZINC	0	0.5	112	9	307000	—	73.76	MG/KG
CM39-003	2085137.6	749214.67	U-235	0	0.5	0.26	0.15	8	1900	0.09	PCI/G
CM39-003	2085137.6	749214.67	U-238	0	0.5	4.47	2.00	351	1600	2.00	PCI/G
CM39-003	2085137.6	749214.67	2-BUTANONE	0	0.5	20	120	192000000	433000	NA	UG/KG
CM39-003	2085137.6	749214.67	ACETONE	0	0.5	100	120	102000000	211000	NA	UG/KG
CM39-003	2085137.6	749214.67	NAPHTHALENE	0	0.5	1	6.1	3090000	—	NA	UG/KG
CM39-008	2085324.91	749179.61	ARSENIC	0	0.5	12	5	22.2	21.6	10.09	MG/KG
CM39-008	2085324.91	749179.61	BARIUM	0	0.5	534	98	26400	—	141.26	MG/KG
CM39-008	2085324.91	749179.61	CHROMIUM	0	0.5	38.8	20	268	—	16.99	MG/KG

Location	Easting	Northing	Analyte	Depth Start (feet)	Depth End (feet)	Result	Detection Limit	Wildlife Refuge Worker Action Level	Ecological Receptor Action Level	Background	Units
CM39-008	2085324.91	749179.61	COBALT	0	0.5	96.3	90	1550	—	10.91	MG/KG
CM39-008	2085324.91	749179.61	COPPER	0	0.5	191	4	40900	—	18.06	MG/KG
CM39-008	2085324.91	749179.61	IRON	0	0.5	35400	2190	307000	—	18037.00	MG/KG
CM39-008	2085324.91	749179.61	MANGANESE	0	0.5	778	158	3480	—	365.08	MG/KG
CM39-008	2085324.91	749179.61	NICKEL	0	0.5	36.4	12	20400	—	14.91	MG/KG
CM39-008	2085324.91	749179.61	STRONTIUM	0	0.5	283	20	613000	—	48.94	MG/KG
CM39-008	2085324.91	749179.61	VANADIUM	0	0.5	109	31	7150	292	45.59	MG/KG
CM39-008	2085324.91	749179.61	ZINC	0	0.5	98.1	9	307000	—	73.76	MG/KG
CM39-008	2085324.91	749179.61	U-235	0	0.5	0.13	0.12	8	1900	0.09	PCI/G
CM39-008	2085324.91	749179.61	U-238	0	0.5	2.04	1.91	351	1600	2.00	PCI/G
CM39-008	2085324.91	749179.61	2-BUTANONE	0	0.5	20	110	192000000	433000	NA	UG/KG
CM39-008	2085324.91	749179.61	ACETONE	0	0.5	70	110	102000000	211000	NA	UG/KG
CM39-008	2085324.91	749179.61	NAPHTHALENE	0	0.5	0.9	5.6	3090000	—	NA	UG/KG
CM39-010	2085262.42	749215.37	BARIUM	0.5	1	914	98	26400	—	141.26	MG/KG
CM39-010	2085262.42	749215.37	CHROMIUM	0.5	1	34	20	268	—	16.99	MG/KG
CM39-010	2085262.42	749215.37	COPPER	0.5	1	154	4	40900	—	18.06	MG/KG
CM39-010	2085262.42	749215.37	IRON	0.5	1	51000	2190	307000	—	18037.00	MG/KG
CM39-010	2085262.42	749215.37	MANGANESE	0.5	1	1580	158	3480	—	365.08	MG/KG
CM39-010	2085262.42	749215.37	NICKEL	0.5	1	63.1	12	20400	—	14.91	MG/KG
CM39-010	2085262.42	749215.37	STRONTIUM	0.5	1	604	20	613000	—	48.94	MG/KG
CM39-010	2085262.42	749215.37	VANADIUM	0.5	1	102	31	7150	292	45.59	MG/KG
CM39-010	2085262.42	749215.37	ZINC	0.5	1	123	9	307000	—	73.76	MG/KG
CM39-010	2085262.42	749215.37	AM-241[1]	0.5	1	5.26	0.41	76	1900	0.02	PCI/G
CM39-010	2085262.42	749215.37	PU-239/240[1]	0.5	1	8.61	N/A	50	3800	0.07	PCI/G
CM39-010	2085262.42	749215.37	U-238	0.5	1	4.31	1.93	351	1600	2.00	PCI/G
CM39-010	2085262.42	749215.37	ACETONE	0.5	1	20	110	102000000	211000	NA	UG/KG
CM39-012	2085169.56	749244.63	BARIUM	0	0.5	574	98	26400	—	141.26	MG/KG

Location	Easting	Northing	Analyte	Depth Start (feet)	Depth End (feet)	Result	Detection Limit	Wildlife Refuge Worker Action Level	Ecological Receptor Action Level	Background	Units
CM39-012	2085169.56	749244.63	CHROMIUM	0	0.5	21.4	20	268	—	16.99	MG/KG
CM39-012	2085169.56	749244.63	COPPER	0	0.5	268	4	40900	—	18.06	MG/KG
CM39-012	2085169.56	749244.63	IRON	0	0.5	19300	2190	307000	—	18037.00	MG/KG
CM39-012	**2085169.56**	**749244.63**	**LEAD**	**0**	**0.5**	**56.6**	**7**	**1000**	**25.6**	**54.62**	**MG/KG**
CM39-012	2085169.56	749244.63	NICKEL	0	0.5	48.6	12	20400	—	14.91	MG/KG
CM39-012	2085169.56	749244.63	STRONTIUM	0	0.5	310	20	613000	—	48.94	MG/KG
CM39-012	2085169.56	749244.63	VANADIUM	0	0.5	62.6	31	7150	292	45.59	MG/KG
CM39-012	2085169.56	749244.63	ZINC	0	0.5	111	9	307000	—	73.76	MG/KG
CM39-012	2085169.56	749244.63	U-238	0	0.5	3.21	1.57	351	1600	2.00	PCI/G
CM39-012	2085169.56	749244.63	XYLENES (TOTAL)	0	0.5	3	11	1000000000	—	NA	UG/KG
CM39-013	**2085296.64**	**749246.81**	**ARSENIC**	**0**	**0.5**	**23.7**	**5**	**22.2**	**21.6**	**10.09**	**MG/KG**
CM39-013	2085296.64	749246.81	BARIUM	0	0.5	568	98	26400	—	141.26	MG/KG
CM39-013	2085296.64	749246.81	CHROMIUM	0	0.5	61.3	20	268	—	16.99	MG/KG
CM39-013	2085296.64	749246.81	COPPER	0	0.5	174	4	40900	—	18.06	MG/KG
CM39-013	2085296.64	749246.81	IRON	0	0.5	47300	2190	307000	—	18037.00	MG/KG
CM39-013	2085296.64	749246.81	NICKEL	0	0.5	81.8	12	20400	—	14.91	MG/KG
CM39-013	2085296.64	749246.81	SELENIUM	0	0.5	1.33	1	5110	—	1.22	MG/KG
CM39-013	2085296.64	749246.81	STRONTIUM	0	0.5	130	20	613000	—	48.94	MG/KG
CM39-013	2085296.64	749246.81	VANADIUM	0	0.5	166	31	7150	292	45.59	MG/KG
CM39-013	2085296.64	749246.81	ZINC	0	0.5	137	9	307000	—	73.76	MG/KG
CM39-013	2085296.64	749246.81	U-235	0	0.5	0.39	0.23	8	1900	0.09	PCI/G
CM39-013	2085296.64	749246.81	U-238	0	0.5	4.39	1.96	351	1600	2.00	PCI/G
CN37-003	2085389.13	748856.15	BARIUM	0	0.5	813	98	26400	—	141.26	MG/KG
CN37-003	2085389.13	748856.15	CHROMIUM	0	0.5	75	20	268	—	16.99	MG/KG
CN37-003	2085389.13	748856.15	COBALT	0	0.5	198	90	1550	—	10.91	MG/KG
CN37-003	2085389.13	748856.15	COPPER	0	0.5	216	4	40900	—	18.06	MG/KG

Location	Easting	Northing	Analyte	Depth Start (feet)	Depth End (feet)	Result	Detection Limit	Wildlife Refuge Worker Action Level	Ecological Receptor Action Level	Background	Units
CN37-003	2085389.13	748856.15	IRON	0	0.5	59900	2190	307000	—	18037.00	MG/KG
CN37-003	2085389.13	748856.15	MANGANESE	0	0.5	1930	158	3480	—	365.08	MG/KG
CN37-003	2085389.13	748856.15	NICKEL	0	0.5	91.6	12	20400	—	14.91	MG/KG
CN37-003	2085389.13	748856.15	STRONTIUM	0	0.5	712	20	613000	—	48.94	MG/KG
CN37-003	2085389.13	748856.15	VANADIUM	0	0.5	118	31	7150	292	45.59	MG/KG
CN37-003	2085389.13	748856.15	ZINC	0	0.5	129	9	307000	—	73.76	MG/KG
CN37-003	2085389.13	748856.15	U-235	0	0.5	0.24	0.15	8	1900	0.09	PCI/G
CN37-003	2085389.13	748856.15	U-238	0	0.5	3.16	1.61	351	1600	2.00	PCI/G
CN37-009	2085388.72	748928.11	BARIUM	0	0.5	898	98	26400	—	141.26	MG/KG
CN37-009	2085388.72	748928.11	CHROMIUM	0	0.5	81.3	20	268	—	16.99	MG/KG
CN37-009	2085388.72	748928.11	COBALT	0	0.5	232	90	1550	—	10.91	MG/KG
CN37-009	2085388.72	748928.11	COPPER	0	0.5	214	4	40900	—	18.06	MG/KG
CN37-009	2085388.72	748928.11	IRON	0	0.5	54200	2190	307000	—	18037.00	MG/KG
CN37-009	2085388.72	748928.11	MANGANESE	0	0.5	1750	158	3480	—	365.08	MG/KG
CN37-009	2085388.72	748928.11	NICKEL	0	0.5	81.1	12	20400	—	14.91	MG/KG
CN37-009	2085388.72	748928.11	STRONTIUM	0	0.5	681	20	613000	—	48.94	MG/KG
CN37-009	2085388.72	748928.11	VANADIUM	0	0.5	104	31	7150	292	45.59	MG/KG
CN37-009	2085388.72	748928.11	ZINC	0	0.5	127	9	307000	—	73.76	MG/KG
CN37-009	2085388.72	748928.11	U-235	0	0.5	0.28	0.18	8	1900	0.09	PCI/G
CN37-009	2085388.72	748928.11	U-238	0	0.5	3.13	2.31	351	1600	2.00	PCI/G
CN37-012	2085427.69	748917.12	ARSENIC	0	0.5	13.8	5	22.2	21.6	10.09	MG/KG
CN37-012	2085427.69	748917.12	BARIUM	0	0.5	604	98	26400	—	141.26	MG/KG
CN37-012	2085427.69	748917.12	CHROMIUM	0	0.5	34.3	20	268	—	16.99	MG/KG
CN37-012	2085427.69	748917.12	COPPER	0	0.5	66.6	4	40900	—	18.06	MG/KG
CN37-012	2085427.69	748917.12	IRON	0	0.5	30100	2190	307000	—	18037.00	MG/KG
CN37-012	2085427.69	748917.12	MANGANESE	0	0.5	623	158	3480	—	365.08	MG/KG

Location	Easting	Northing	Analyte	Depth Start (feet)	Depth End (feet)	Result	Detection Limit	Wildlife Refuge Worker Action Level	Ecological Receptor Action Level	Background	Units
CN37-012	2085427.69	748917.12	NICKEL	0	0.5	27.2	12	20400	—	14.91	MG/KG
CN37-012	2085427.69	748917.12	STRONTIUM	0	0.5	284	20	613000	—	48.94	MG/KG
CN37-012	2085427.69	748917.12	VANADIUM	0	0.5	63.7	31	7150	292	45.59	MG/KG
CN37-012	2085427.69	748917.12	ZINC	0	0.5	108	9	307000	—	73.76	MG/KG
CN37-012	2085427.69	748917.12	U-235	0	0.5	0.21	0.15	8	1900	0.09	PCI/G
CN37-012	2085427.69	748917.12	U-238	0	0.5	3.91	1.74	351	1600	2.00	PCI/G
CN37-012	2085427.69	748917.12	NAPHTHALENE	0	0.5	2	5.8	3090000	—	NA	UG/KG
CN37-013	2085404.41	748811.76	ARSENIC	0	0.5	15.2	5	22.2	21.6	10.09	MG/KG
CN37-013	2085404.41	748811.76	BARIUM	0	0.5	737	98	26400	—	141.26	MG/KG
CN37-013	2085404.41	748811.76	CHROMIUM	0	0.5	28.2	20	268	—	16.99	MG/KG
CN37-013	2085404.41	748811.76	COPPER	0	0.5	90.2	4	40900	—	18.06	MG/KG
CN37-013	2085404.41	748811.76	IRON	0	0.5	31500	2190	307000	—	18037.00	MG/KG
CN37-013	2085404.41	748811.76	MANGANESE	0	0.5	570	158	3480	—	365.08	MG/KG
CN37-013	2085404.41	748811.76	NICKEL	0	0.5	43.7	12	20400	—	14.91	MG/KG
CN37-013	2085404.41	748811.76	STRONTIUM	0	0.5	246	20	613000	—	48.94	MG/KG
CN37-013	2085404.41	748811.76	VANADIUM	0	0.5	102	31	7150	292	45.59	MG/KG
CN37-013	2085404.41	748811.76	ZINC	0	0.5	152	9	307000	—	73.76	MG/KG
CN37-013	2085404.41	748811.76	U-235	0	0.5	0.14	0.11	8	1900	0.09	PCI/G
CN37-013	2085404.41	748811.76	U-238	0	0.5	2.55	1.87	351	1600	2.00	PCI/G
CN37-013	2085404.41	748811.76	ETHYLBENZENE	0	0.5	11	5.9	4250000	—	NA	UG/KG
CN37-013	2085404.41	748811.76	XYLENES (TOTAL)	0	0.5	92	12	1000000000	—	NA	UG/KG
CN38-003	2085388.31	749000.11	ARSENIC	0	0.5	11.4	5	22.2	21.6	10.09	MG/KG
CN38-003	2085388.31	749000.11	BARIUM	0	0.5	739	98	26400	—	141.26	MG/KG
CN38-003	2085388.31	749000.11	CHROMIUM	0	0.5	95.7	20	268	—	16.99	MG/KG
CN38-003	2085388.31	749000.11	COBALT	0	0.5	206	90	1550	—	10.91	MG/KG
CN38-003	2085388.31	749000.11	COPPER	0	0.5	160	4	40900	—	18.06	MG/KG
CN38-003	2085388.31	749000.11	IRON	0	0.5	46800	2190	307000	—	18037.00	MG/KG

Location	Easting	Northing	Analyte	Depth Start (feet)	Depth End (feet)	Result	Detection Limit	Wildlife Refuge Worker Action Level	Ecological Receptor Action Level	Background	Units
CN38-003	2085388.31	749000.11	MANGANESE	0	0.5	1260	158	3480	—	365.08	MG/KG
CN38-003	2085388.31	749000.11	NICKEL	0	0.5	85.7	12	20400	—	14.91	MG/KG
CN38-003	2085388.31	749000.11	STRONTIUM	0	0.5	512	20	613000	—	48.94	MG/KG
CN38-003	2085388.31	749000.11	VANADIUM	0	0.5	97	31	7150	292	45.59	MG/KG
CN38-003	2085388.31	749000.11	ZINC	0	0.5	111	9	307000	—	73.76	MG/KG
CN38-003	2085388.31	749000.11	AM-241[1]	0	0.5	5.13	0.47	76	1900	0.02	PCI/G
CN38-003	2085388.31	749000.11	PU-239/240[1]	0	0.5	7.73	N/A	50	3800	0.07	PCI/G
CN38-003	2085388.31	749000.11	U-235	0	0.5	0.19	0.12	8	1900	0.09	PCI/G
CN38-003	2085388.31	749000.11	U-238	0	0.5	4.05	1.62	351	1600	2.00	PCI/G
CN38-009	2085382.79	749072.3	ARSENIC	0	0.5	12.3	5	22.2	21.6	10.09	MG/KG
CN38-009	2085382.79	749072.3	BARIUM	0	0.5	703	98	26400	—	141.26	MG/KG
CN38-009	2085382.79	749072.3	CHROMIUM	0	0.5	69.5	20	268	—	16.99	MG/KG
CN38-009	2085382.79	749072.3	COBALT	0	0.5	105	90	1550	—	10.91	MG/KG
CN38-009	2085382.79	749072.3	COPPER	0	0.5	125	4	40900	—	18.06	MG/KG
CN38-009	2085382.79	749072.3	IRON	0	0.5	36500	2190	307000	—	18037.00	MG/KG
CN38-009	2085382.79	749072.3	MANGANESE	0	0.5	810	158	3480	—	365.08	MG/KG
CN38-009	2085382.79	749072.3	NICKEL	0	0.5	44.3	12	20400	—	14.91	MG/KG
CN38-009	2085382.79	749072.3	STRONTIUM	0	0.5	322	20	613000	—	48.94	MG/KG
CN38-009	2085382.79	749072.3	VANADIUM	0	0.5	99.6	31	7150	292	45.59	MG/KG
CN38-009	2085382.79	749072.3	ZINC	0	0.5	92.6	9	307000	—	73.76	MG/KG
CN38-009	2085382.79	749072.3	XYLENES (TOTAL)	0	0.5	7	11	1000000000	—	NA	UG/KG
CN38-015	2085387.48	749144.08	ARSENIC	0	0.5	17	5	22.2	21.6	10.09	MG/KG
CN38-015	2085387.48	749144.08	BARIUM	0	0.5	639	98	26400	—	141.26	MG/KG
CN38-015	2085387.48	749144.08	CHROMIUM	0	0.5	56.8	20	268	—	16.99	MG/KG
CN38-015	2085387.48	749144.08	COPPER	0	0.5	173	4	40900	—	18.06	MG/KG
CN38-015	2085387.48	749144.08	IRON	0	0.5	33100	2190	307000	—	18037.00	MG/KG
CN38-015	2085387.48	749144.08	MANGANESE	0	0.5	607	158	3480	—	365.08	MG/KG

Location	Easting	Northing	Analyte	Depth Start (feet)	Depth End (feet)	Result	Detection Limit	Wildlife Refuge Worker Action Level	Ecological Receptor Action Level	Background	Units
CN38-015	2085387.48	749144.08	NICKEL	0	0.5	39.1	12	20400	—	14.91	MG/KG
CN38-015	2085387.48	749144.08	STRONTIUM	0	0.5	232	20	613000	—	48.94	MG/KG
CN38-015	2085387.48	749144.08	VANADIUM	0	0.5	120	31	7150	292	45.59	MG/KG
CN38-015	2085387.48	749144.08	ZINC	0	0.5	118	9	307000	—	73.76	MG/KG
CN38-015	2085387.48	749144.08	AM-241[I]	0	0.5	6.26	0.59	76	1900	0.02	PCI/G
CN38-015	2085387.48	749144.08	PU-239/240[I]	0	0.5	15.09	N/A	50	3800	0.07	PCI/G
CN38-015	2085387.48	749144.08	U-235	0	0.5	0.19	0.13	8	1900	0.09	PCI/G
CN38-015	2085387.48	749144.08	U-238	0	0.5	3.33	2.23	351	1600	2.00	PCI/G
CN38-015	2085387.48	749144.08	2-BUTANONE	0	0.5	50	110	192000000	433000	NA	UG/KG
CN38-015	2085387.48	749144.08	ACETONE	0	0.5	160	110	102000000	211000	NA	UG/KG
CN38-015	2085387.48	749144.08	BENZENE	0	0.5	3	5.4	205000	—	NA	UG/KG
CN38-016	2085430.53	749116.01	ARSENIC	0	0.5	15.1	5	22.2	21.6	10.09	MG/KG
CN38-016	2085430.53	749116.01	BARIUM	0	0.5	692	98	26400	—	141.26	MG/KG
CN38-016	2085430.53	749116.01	CHROMIUM	0	0.5	25.6	20	268	—	16.99	MG/KG
CN38-016	2085430.53	749116.01	COPPER	0	0.5	110	4	40900	—	18.06	MG/KG
CN38-016	2085430.53	749116.01	IRON	0	0.5	22800	2190	307000	—	18037.00	MG/KG
CN38-016	2085430.53	749116.01	MANGANESE	0	0.5	448	158	3480	—	365.08	MG/KG
CN38-016	2085430.53	749116.01	NICKEL	0	0.5	32.3	12	20400	—	14.91	MG/KG
CN38-016	2085430.53	749116.01	STRONTIUM	0	0.5	320	20	613000	—	48.94	MG/KG
CN38-016	2085430.53	749116.01	VANADIUM	0	0.5	57.2	31	7150	292	45.59	MG/KG
CN38-016	2085430.53	749116.01	ZINC	0	0.5	114	9	307000	—	73.76	MG/KG
CN38-016	2085430.53	749116.01	U-235	0	0.5	0.24	0.14	8	1900	0.09	PCI/G
CN38-016	2085430.53	749116.01	U-238	0	0.5	4.52	2.07	351	1600	2.00	PCI/G
CN38-017	2085428.68	749021.97	ARSENIC	0	0.5	13.9	5	22.2	21.6	10.09	MG/KG
CN38-017	2085428.68	749021.97	BARIUM	0	0.5	605	98	26400	—	141.26	MG/KG
CN38-017	2085428.68	749021.97	CHROMIUM	0	0.5	32.6	20	268	—	16.99	MG/KG
CN38-017	2085428.68	749021.97	COPPER	0	0.5	153	4	40900	—	18.06	MG/KG

Location	Easting	Northing	Analyte	Depth Start (feet)	Depth End (feet)	Result	Detection Limit	Wildlife Refuge Worker Action Level	Ecological Receptor Action Level	Background	Units
CN38-017	2085428.68	749021.97	IRON	0	0.5	31200	2190	307000	—	18037.00	MG/KG
CN38-017	2085428.68	749021.97	MANGANESE	0	0.5	447	158	3480	—	365.08	MG/KG
CN38-017	2085428.68	749021.97	NICKEL	0	0.5	49.5	12	20400	—	14.91	MG/KG
CN38-017	2085428.68	749021.97	STRONTIUM	0	0.5	261	20	613000	—	48.94	MG/KG
CN38-017	2085428.68	749021.97	VANADIUM	0	0.5	107	31	7150	292	45.59	MG/KG
CN38-017	2085428.68	749021.97	ZINC	0	0.5	120	9	307000	—	73.76	MG/KG
CN38-017	2085428.68	749021.97	U-235	0	0.5	0.12	0.11	8	1900	0.09	PCI/G
CN38-017	2085428.68	749021.97	U-238	0	0.5	3.72	2.74	351	1600	2.00	PCI/G
CN38-017	2085428.68	749021.97	XYLENES (TOTAL)	0	0.5	6	11	1000000000	—	NA	UG/KG
CN39-005	2085387.08	749216.11	ARSENIC	0.5	1	12.6	5	22.2	21.6	10.09	MG/KG
CN39-005	2085387.08	749216.11	BARIUM	0.5	1	800	98	26400	—	141.26	MG/KG
CN39-005	2085387.08	749216.11	CHROMIUM	0.5	1	43.1	20	268	—	16.99	MG/KG
CN39-005	2085387.08	749216.11	COPPER	0.5	1	102	4	40900	—	18.06	MG/KG
CN39-005	2085387.08	749216.11	IRON	0.5	1	37600	2190	307000	—	18037.00	MG/KG
CN39-005	2085387.08	749216.11	MANGANESE	0.5	1	728	158	3480	—	365.08	MG/KG
CN39-005	2085387.08	749216.11	NICKEL	0.5	1	58.5	12	20400	—	14.91	MG/KG
CN39-005	2085387.08	749216.11	STRONTIUM	0.5	1	265	20	613000	—	48.94	MG/KG
CN39-005	2085387.08	749216.11	VANADIUM	0.5	1	78.7	31	7150	292	45.59	MG/KG
CN39-005	2085387.08	749216.11	ZINC	0.5	1	93.8	9	307000	—	73.76	MG/KG
CN39-005	2085387.08	749216.11	U-235	0.5	1	0.28	0.16	8	1900	0.09	PCI/G
CN39-005	2085387.08	749216.11	U-238	0.5	1	4.02	1.78	351	1600	2.00	PCI/G
CN39-005	2085387.08	749216.11	ACETONE	0.5	1	120	110	102000000	211000	NA	UG/KG
CN39-006	2085436.05	749242.37	ARSENIC	0	0.5	11.1	5	22.2	21.6	10.09	MG/KG
CN39-006	2085436.05	749242.37	BARIUM	0	0.5	712	98	26400	—	141.26	MG/KG
CN39-006	2085436.05	749242.37	CHROMIUM	0	0.5	27.1	20	268	—	16.99	MG/KG
CN39-006	2085436.05	749242.37	COPPER	0	0.5	95.8	4	40900	—	18.06	MG/KG
CN39-006	2085436.05	749242.37	IRON	0	0.5	33200	2190	307000	—	18037.00	MG/KG

Location	Easting	Northing	Analyte	Depth Start (feet)	Depth End (feet)	Result	Detection Limit	Wildlife Refuge Worker Action Level	Ecological Receptor Action Level	Background	Units
CN39-006	2085436.05	749242.37	MANGANESE	0	0.5	576	158	3480	—	365.08	MG/KG
CN39-006	2085436.05	749242.37	NICKEL	0	0.5	46.7	12	20400	—	14.91	MG/KG
CN39-006	2085436.05	749242.37	STRONTIUM	0	0.5	261	20	613000	—	48.94	MG/KG
CN39-006	2085436.05	749242.37	VANADIUM	0	0.5	116	31	7150	292	45.59	MG/KG
CN39-006	2085436.05	749242.37	ZINC	0	0.5	148	9	307000	—	73.76	MG/KG
CN39-006	2085436.05	749242.37	U-235	0	0.5	0.18	0.14	8	1900	0.09	PCI/G
CN39-006	2085436.05	749242.37	U-238	0	0.5	3.72	1.84	351	1600	2.00	PCI/G

[1] $Pu^{239/240}$ and Am^{241} results inferred from HPGe Am^{241}
N/A – Not applicable.
Bold lettering denotes Ecological Receptor Action Level Exceedance.

Table 3
IHSS Group 900-3 Summary of Analytical Results

Media	Analyte Name	Number Samples	Detection Frequency	Mean	Minimum	Maximum	Wildlife Refuge Worker Action Level	Ecological Receptor Action Level	Background	Unit
Surface Soil	ANTIMONY	43	21%	5.42	3.50	24.80	409	—	N/A	MG/KG
Surface Soil	**ARSENIC**	**43**	**91%**	**11.43**	**2.50**	**23.70**	**22.2**	**21.6**	**10.09**	**MG/KG**
Surface Soil	BARIUM	43	100%	694.02	355.00	922.00	26400	—	141.26	MG/KG
Surface Soil	CADMIUM	43	5%	1.60	1.50	4.09	962	—	1.61	MG/KG
Surface Soil	CHROMIUM	43	95%	46.87	10.00	116.00	268	—	16.99	MG/KG
Surface Soil	COBALT	43	23%	83.17	45.00	306.00	1550	—	10.91	MG/KG
Surface Soil	COPPER	43	100%	145.36	42.90	268.00	40900	—	18.06	MG/KG
Surface Soil	CYANIDE, TOTAL	43	70%	0.20	0.14	0.35	20400	—	N/A	MG/KG
Surface Soil	IRON	43	100%	39058.14	12900.00	59900.00	307000	—	18037.00	MG/KG
Surface Soil	**LEAD**	**43**	**100%**	**29.89**	**11.30**	**56.60**	**1000**	**25.6**	**54.62**	**MG/KG**
Surface Soil	MANGANESE	43	100%	917.70	186.00	1930.00	3480	—	365.08	MG/KG
Surface Soil	MOLYBDENUM	43	0%	25.00	25.00	25.00	5110	—	N/A	MG/KG
Surface Soil	NICKEL	43	100%	56.65	27.20	99.00	20400	—	14.91	MG/KG
Surface Soil	NITRATE AS N	43	93%	3.85	2.20	28.00	1000000	—	N/A	MG/KG
Surface Soil	SELENIUM	43	7%	0.55	0.50	1.33	5110	—	1.22	MG/KG
Surface Soil	SILVER	43	0%	2.50	2.50	2.50	5110	—	N/A	MG/KG
Surface Soil	STRONTIUM	43	100%	384.40	130.00	718.00	613000	—	48.94	MG/KG
Surface Soil	TIN	43	19%	2.54	2.00	6.61	613000	—	N/A	MG/KG
Surface Soil	VANADIUM	43	100%	102.94	36.00	166.00	7150	292	45.59	MG/KG
Surface Soil	ZINC	43	100%	117.70	46.10	236.00	307000	—	73.76	MG/KG
Surface Soil	AM-241[1]	43	9%	2.83	2.30	6.26	76	1900	0.02	PCI/G
Surface Soil	PU-239/240[1]	43	9%	4.44	2.16	15.09	50	3800	0.07	PCI/G
Surface Soil	U-235	43	72%	0.18	0.00	0.39	8	1900	0.09	PCI/G
Surface Soil	U-238	43	100%	3.45	1.65	6.50	351	1600	2.00	PCI/G
Surface Soil	1,1,1-TRICHLOROETHANE	43	0%	0.57	0.53	0.64	79700000	—	N/A	UG/KG

Media	Analyte Name	Number Samples	Detection Frequency	Mean	Minimum	Maximum	Wildlife Refuge Worker Action Level	Ecological Receptor Action Level	Background	Unit
Surface Soil	1,1,2,2-TETRACHLOROETHANE	43	0%	0.51	0.47	0.56	100000	—	N/A	UG/KG
Surface Soil	1,1,2-TRICHLOROETHANE	43	0%	0.49	0.45	0.54	236000	—	N/A	UG/KG
Surface Soil	1,1-DICHLOROETHANE	43	0%	0.52	0.48	0.57	22500000	—	N/A	UG/KG
Surface Soil	1,1-DICHLOROETHENE	43	0%	0.78	0.72	0.86	17000	—	N/A	UG/KG
Surface Soil	1,2,4-TRICHLOROBENZENE	43	0%	0.51	0.47	0.56	9230000	—	N/A	UG/KG
Surface Soil	1,2-DICHLOROETHANE	43	0%	0.52	0.48	0.58	106000	—	N/A	UG/KG
Surface Soil	1,2-DICHLOROPROPANE	43	0%	0.45	0.41	0.50	345000	—	N/A	UG/KG
Surface Soil	2-BUTANONE	43	14%	8.01	4.82	50.00	192000000	433000	N/A	UG/KG
Surface Soil	4-METHYL-2-PENTANONE	43	0%	3.54	3.26	3.91	16400000	—	N/A	UG/KG
Surface Soil	ACETONE	43	44%	28.02	4.84	160.00	102000000	211000	N/A	UG/KG
Surface Soil	BENZENE	43	2%	0.49	0.39	3.00	205000	—	N/A	UG/KG
Surface Soil	BROMODICHLOROMETHANE	43	0%	0.36	0.33	0.40	617000	—	N/A	UG/KG
Surface Soil	BROMOFORM	43	0%	0.58	0.54	0.65	3730000	—	N/A	UG/KG
Surface Soil	BROMOMETHANE	43	0%	0.83	0.77	0.93	193000	—	N/A	UG/KG
Surface Soil	CARBON DISULFIDE	43	0%	1.44	1.33	1.60	15100000	—	N/A	UG/KG
Surface Soil	CARBON TETRACHLORIDE	43	0%	0.61	0.57	0.68	81500	618000	N/A	UG/KG
Surface Soil	CHLOROBENZENE	43	0%	0.52	0.48	0.57	6090000	—	N/A	UG/KG
Surface Soil	CHLOROETHANE	43	0%	2.03	1.88	2.25	13200000	—	N/A	UG/KG
Surface Soil	CHLOROFORM	43	0%	0.47	0.43	0.52	19200	101000	N/A	UG/KG
Surface Soil	CHLOROMETHANE	43	0%	0.73	0.68	0.81	371000	—	N/A	UG/KG
Surface Soil	CIS-1,3-DICHLOROPROPENE	43	0%	0.46	0.42	0.51	250000	—	N/A	UG/KG
Surface Soil	DIBROMOCHLOROMETHANE	43	0%	0.38	0.35	0.42	329000	—	N/A	UG/KG
Surface Soil	ETHYLBENZENE	43	7%	1.47	0.51	21.00	4250000	—	N/A	UG/KG
Surface Soil	HEXACHLOROBUTADIENE	43	0%	0.65	0.60	0.72	147000	—	N/A	UG/KG
Surface Soil	METHYLENE CHLORIDE	43	0%	0.58	0.54	0.65	2530000	39500	N/A	UG/KG
Surface Soil	NAPHTHALENE	43	16%	0.56	0.40	2.00	3090000	—	N/A	UG/KG

Media	Analyte Name	Number Samples	Detection Frequency	Mean	Minimum	Maximum	Wildlife Refuge Worker Action Level	Ecological Receptor Action Level	Background	Unit
Surface Soil	O-DICHLOROBENZENE	43	0%	0.38	0.35	0.42	31200000	—	N/A	UG/KG
Surface Soil	P-DICHLOROBENZENE	43	0%	0.58	0.54	0.64	840000	—	N/A	UG/KG
Surface Soil	STYRENE	43	0%	0.55	0.51	0.61	123000000	—	N/A	UG/KG
Surface Soil	TETRACHLOROETHENE	43	0%	0.66	0.61	0.73	615000	529000	N/A	UG/KG
Surface Soil	TOLUENE	43	0%	0.68	0.63	0.76	31300000	329000	N/A	UG/KG
Surface Soil	TRANS-1,3-DICHLOROPROPENE	43	0%	0.49	0.45	0.54	250000	—	N/A	UG/KG
Surface Soil	TRICHLOROETHENE	43	0%	0.35	0.32	0.38	19600	509000	N/A	UG/KG
Surface Soil	VINYL CHLORIDE	43	0%	1.53	1.41	1.70	41200	431	N/A	UG/KG
Surface Soil	XYLENES (TOTAL)	43	19%	9.46	1.26	170.00	1000000000	—	N/A	UG/KG

[1] $Pu^{239/240}$ and Am^{241} results inferred from HPGe Am^{241}
N/A – Not applicable
Bold lettering denotes Ecological Receptor Action Level Exceedance.

Table 4
Radionuclide Sum of Ratio Calculations

Media	Location Code	Depth Start (feet)	Depth End (feet)	WRW SOR
Surface Soil	CM37-003	0.3	0.8	0.05
Surface Soil	CM37-014	0.5	1	0.00
Surface Soil	CM37-016	0.3	0.8	0.00
Surface Soil	CM37-027	0.5	1	0.03
Surface Soil	CM38-001	0.3	0.8	0.04
Surface Soil	CM38-003	0.25	0.67	0.00
Surface Soil	CM38-011	0.5	1	0.02
Surface Soil	CM38-013	0.3	0.8	0.01
Surface Soil	CM38-015	0.33	0.75	0.04
Surface Soil	CM38-025	0.5	1	0.05
Surface Soil	CM38-027	0.3	0.8	0.03
Surface Soil	CM38-029	0.5	1	0.01
Surface Soil	CM38-038	0.5	1	0.04
Surface Soil	CM39-001	0.25	0.67	0.03
Surface Soil	CM39-010	0.5	1	0.02
Surface Soil	CN39-005	0.5	1	0.05
Surface Soil	CL37-000	0	0.5	0.04
Surface Soil	CL37-001	0	0.5	0.03
Surface Soil	CL38-000	0	0.5	0.03
Surface Soil	CL39-000	0	0.5	0.05
Surface Soil	CM37-005	0	0.5	0.04
Surface Soil	CM37-012	0	0.5	0.05
Surface Soil	CM37-018	0	0.5	0.03
Surface Soil	CM37-025	0	0.5	0.01
Surface Soil	CM37-031	0	0.5	0.01
Surface Soil	CM37-032	0	0.5	0.04
Surface Soil	CM38-009	0	0.5	0.05
Surface Soil	CM38-023	0	0.5	0.04
Surface Soil	CM38-036	0	0.5	0.01
Surface Soil	CM39-003	0	0.5	0.04
Surface Soil	CM39-008	0	0.5	0.02
Surface Soil	CM39-012	0	0.5	0.01
Surface Soil	CM39-013	0	0.5	0.06
Surface Soil	CN37-003	0	0.5	0.04
Surface Soil	CN37-009	0	0.5	0.04
Surface Soil	CN37-012	0	0.5	0.04
Surface Soil	CN37-013	0	0.5	0.03
Surface Soil	CN38-003	0	0.5	0.04
Surface Soil	CN38-009	0	0.5	0.00
Surface Soil	CN38-015	0	0.5	0.05
Surface Soil	CN38-016	0	0.5	0.04
Surface Soil	CN38-017	0	0.5	0.03
Surface Soil	CN39-006	0	0.5	0.03

Table 5
IHSS Group 900-3 Deviations from Planned Sampling Specifications

IHSS Group	IHSS/PAC/UBC Site	Location Code	Actual Easting	Actual Northing	Actual Depth Interval	Planned Depth Interval	Planned Location	Planned Easting	Planned Northing	Comment
900-3	900-213	CL37-000	2085116.92	748829.83	0-0.5	0-0.5	CL37-000	2085107.08	748832.02	Lateral offset due to the presence of a utility or other impediment, but closer to 904 Pad.
900-3	900-213	CL37-001	2085108.21	748940.14	0-0.5	0-0.5	CL37-001	2085108.19	748940.18	No significant variations.
900-3	900-213	CL38-000	2085109.33	749041.67	0-0.5	0-0.5	CL38-000	2085109.31	749041.66	No significant variations.
900-3	900-213	CL39-000	2085107.09	749162.13	0-0.5	0-0.5	CL39-000	2085107.08	749162.09	No significant variations.
900-3	900-213	CM37-003	2085202.28	748819.05	0.3-0.8	0-0.5	CM37-003	2085202.28	748819.05	Sample depth variation due to overlying asphalt/fill.
900-3	900-213	CM37-005	2085139.72	748854.70	0-0.5	0-0.5	CM37-005	2085139.72	748854.70	No significant variations.
900-3	900-213	CM37-012	2085319.92	748823.27	0-0.5	0-0.5	CM37-012	2085326.98	748819.76	Lateral offset due to the presence of a utility or other impediment.
900-3	900-213	CM37-014	2085264.42	748855.40	0.5-1	0-0.5	CM37-014	2085264.42	748855.41	Sample depth variation due to overlying asphalt/fill.
900-3	900-213	CM37-016	2085201.87	748891.05	0.3-0.8	0-0.5	CM37-016	2085201.87	748891.05	Sample depth variation due to overlying asphalt/fill.
900-3	900-213	CM37-018	2085139.31	748926.69	0-0.5	0-0.5	CM37-018	2085139.31	748926.69	No significant variations.
900-3	900-213	CM37-025	2085324.13	748887.90	0-0.5	0-0.5	CM37-025	2085326.57	748891.76	Lateral offset due to the presence of a utility or other impediment.
900-3	900-213	CM37-027	2085264.01	748927.41	0.5-1	0-0.5	CM37-027	2085264.01	748927.41	Sample depth variation due to overlying asphalt/fill.
900-3	900-213	CM37-031	2085322.33	748766.19	0-0.5	0-0.5	CM37-031	2085322.30	748766.23	No significant variations.
900-3	900-213	CM37-032	2085200.75	748769.60	0-0.5	0-0.5	CM37-032	2085200.75	748769.57	No significant variations.
900-3	900-213	CM38-001	2085201.46	748963.05	0.3-0.8	0-0.5	CM38-001	2085201.46	748963.05	Sample depth variation due to overlying asphalt/fill.
900-3	900-213	CM38-003	2085138.82	748998.80	0.25-0.67	0-0.5	CM38-003	2085138.90	748998.69	Sample depth variation due to overlying asphalt/fill.
900-3	900-213	CM38-009	2085326.16	748963.78	0-0.5	0-0.5	CM38-009	2085326.16	748963.76	No significant variations.
900-3	900-213	CM38-011	2085263.60	748999.40	0.5-1	0-0.5	CM38-011	2085263.60	748999.40	Sample depth variation due to overlying asphalt/fill.
900-3	900-213	CM38-013	2085201.01	749035.04	0.3-0.8	0-0.5	CM38-013	2085201.05	749035.05	Sample depth variation due to overlying asphalt/fill.
900-3	900-213	CM38-015	2085138.48	749070.78	0.33-0.75	0-0.5	CM38-015	2085138.49	749070.69	Sample depth variation due to overlying asphalt/fill.
900-3	900-213	CM38-023	2085325.75	749035.78	0-0.5	0-0.5	CM38-023	2085325.75	749035.76	No significant variations.
900-3	900-213	CM38-025	2085263.18	749071.46	0.5-1	0-0.5	CM38-025	2085263.19	749071.40	Sample depth variation due to overlying asphalt/fill.
900-3	900-213	CM38-027	2085200.69	749107.08	0.3-0.8	0-0.5	CM38-027	2085200.63	749107.05	Sample depth variation due to overlying asphalt/fill.
900-3	900-213	CM38-029	2085138.11	749142.68	0.5-1	0-0.5	CM38-029	2085138.08	749142.69	Sample depth variation due to overlying asphalt/fill.
900-3	900-213	CM38-036	2085325.34	749107.76	0-0.5	0-0.5	CM38-036	2085325.34	749107.76	No significant variations.
900-3	900-213	CM38-038	2085262.77	749143.42	0.5-1	0-0.5	CM38-038	2085262.78	749143.40	Sample depth variation due to overlying asphalt/fill.

IHSS Group	IHSS/PAC/UBC Site	Location Code	Actual Easting	Actual Northing	Actual Depth Interval	Planned Depth Interval	Planned Location	Planned Easting	Planned Northing	Comment
900-3	900-213	CM39-001	2085200.19	749179.07	0.25-0.67	0-0.5	CM39-001	2085200.22	749179.05	Sample depth variation due to overlying asphalt/fill.
900-3	900-213	CM39-003	2085137.60	749214.67	0-0.5	0-0.5	CM39-003	2085137.67	749214.69	No significant variations.
900-3	900-213	CM39-008	2085324.91	749179.61	0-0.5	0-0.5	CM39-008	2085324.93	749179.76	No significant variations.
900-3	900-213	CM39-010	2085262.42	749215.37	0.5-1	0-0.5	CM39-010	2085262.37	749215.40	Sample depth variation due to overlying asphalt/fill.
900-3	900-213	CM39-012	2085169.56	749244.63	0-0.5	0-0.5	CM39-012	2085169.53	749244.61	No significant variations.
900-3	900-213	CM39-013	2085296.64	749246.81	0-0.5	0-0.5	CM39-013	2085296.65	749246.84	No significant variations.
900-3	900-213	CN37-003	2085389.13	748856.15	0-0.5	0-0.5	CN37-003	2085389.13	748856.12	No significant variations.
900-3	900-213	CN37-009	2085388.72	748928.11	0-0.5	0-0.5	CN37-009	2085388.72	748928.12	No significant variations.
900-3	900-213	CN37-012	2085427.69	748917.12	0-0.5	0-0.5	CN37-012	2085443.84	748911.19	Lateral offset due to the presence of a utility or other impediment, but closer to 904 Pad.
900-3	900-213	CN37-013	2085404.41	748811.76	0-0.5	0-0.5	CN37-013	2085422.66	748804.14	Lateral offset due to the presence of a utility or other impediment, but closer to 904 Pad.
900-3	900-213	CN38-003	2085388.31	749000.11	0-0.5	0-0.5	CN38-003	2085388.31	749000.12	No significant variations.
900-3	900-213	CN38-009	2085382.79	749072.30	0-0.5	0-0.5	CN38-009	2085387.90	749072.11	Lateral offset due to the presence of a utility or other impediment.
900-3	900-213	CN38-015	2085387.48	749144.08	0-0.5	0-0.5	CN38-015	2085387.49	749144.11	No significant variations.
900-3	900-213	CN38-016	2085430.53	749116.01	0-0.5	0-0.5	CN38-016	2085441.61	749117.49	Lateral offset due to the presence of a utility or other impediment, but closer to 904 Pad.
900-3	900-213	CN38-017	2085428.68	749021.97	0-0.5	0-0.5	CN38-017	2085442.73	749022.70	Lateral offset due to the presence of a utility or other impediment, but closer to 904 Pad.
900-3	900-213	CN39-005	2085387.08	749216.11	0.5-1	0-0.5	CN39-005	2085387.08	749216.11	Sample depth variation due to overlying asphalt/fill.
900-3	900-213	CN39-006	2085436.05	749242.37	0-0.5	0-0.5	CN39-006	2085436.04	749242.38	No significant variations.

Note: No deviations between the planned and actual analyte suite.

4.0 DATA QUALITY ASSESSMENT (DQA)

The Data Quality Objectives (DQOs) for this project are described in the IASAP (DOE 2002). All DQOs for this project were achieved based on the following:

- Regulatory agency approved sampling program design (IASAP Addendum #IA-03-01 [DOE 2002a);
- Collection of samples in accordance with the sampling design;
- Results of the Data Quality Assessment as described in the following sections.

4.1.1 Data Quality Assessment Process

The DQA process ensures that the type, quantity and quality of environmental data used in decision making are defensible, and is based on the following guidance and requirements:

- EPA QA/G-4, 1994a, Guidance for the Data Quality Objective Process;
- EPA QA/G-9, 1998, Guidance for the Data Quality Assessment Process; Practical Methods for Data Analysis; and
- DOE Order 414.1A, 1999, Quality Assurance.

Verification and Validation (V&V) of the data are the primary components of the DQA. The final data are compared with original project DQOs and evaluated with respect to project decisions; uncertainty within the decisions; and quality criteria required for the data, specifically precision, accuracy, representativeness, completeness, comparability, and sensitivity (PARCCS). Validation criteria are consistent with the following RFETS-specific documents and industry guidelines:

- EPA 540/R-94/012, 1994b, USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review.
- EPA 540/R-94/013, 1994c, USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review.
- Kaiser-Hill Company, L.L.C.(K-H) V&V Guidelines.
- General Guidelines for Data Verification and Validation, DA-GR01-v2, 2002a.
- V&V Guidelines for Isotopic Determinations by Alpha Spectrometry, DA-RC01-v2, 2002b.
- V&V Guidelines for Volatile Organics, DA-SS01-v3, 2002c.
- V&V Guidelines for Semivolatile Organics, DA-SS02-v3, 2002d.

- V&V Guidelines for Metals, DA-SS05-v3, 2002e.
- Lockheed-Martin, 1997, Evaluation of Radiochemical Data Usability, ES/ER/MS-5.

This report will be submitted to the Comprehensive Environmental, Response, Compensation and Liability Act (CERCLA) Administrative Record (AR) for permanent storage 30 days after being provided to CDPHE and/or U.S. EPA.

4.1.2 Verification and Validation of Results

Verification ensures that data produced and used by the project are documented and traceable in accordance with quality requirements. Validation consists of a technical review of all data that directly support the project decisions so that any limitations of the data relative to project goals are delineated and the associated data are qualified accordingly. The V&V process defines the criteria that constitute data quality, namely PARCCS parameters. Data traceability and archival are also addressed. V&V criteria include the following:

- Chain-of-custody;
- Preservation and hold-times;
- Instrument calibrations;
- Preparation blanks;
- Interference check samples (metals);
- Matrix spikes/matrix spike duplicates (MS/MSD);
- Laboratory control samples (LCS);
- Field duplicate measurements;
- Chemical yield (radiochemistry);
- Required quantitation limits/minimum detectable activities (sensitivity of chemical and radiochemical measurements, respectively); and
- Sample analysis and preparation methods.

Evaluation of V&V criteria ensures that PARCCS parameters are satisfactory (i.e., within tolerances acceptable to the project). Satisfactory V&V of laboratory quality controls are captured through application of validation "flags" or qualifiers to individual records. Quality control samples are summarized and reported relative to two basic metrics: 1) the frequency of QC measurements (e.g., 1 sample per lab batch), and 2) the results, or performance, of the QC sample analyses. Generally, a minimum number of QC samples must be analyzed, and results must fall within predefined tolerance limits; violation of either of these criteria results in qualification or rejection of the data. Results are

discussed relative to RFCA action levels to determine if project decisions are impacted. Based on the V&V criteria, the data quality is acceptable for project decisions.

Raw hardcopy data (e.g., individual analytical data packages) are currently filed by RIN and are maintained by Kaiser-Hill Analytical Services Division; older hardcopies may reside in the Federal Center in Lakewood, Colorado. Electronic data are stored in the RFETS Soil and Water Database (SWD).

Both real and QC data, as of June 18, 2003 are included on the enclosed CD in Microsoft ACCESS 2000 format: (Filename 903_904_016803.mdb, "SWD&LIMS_dqa_real_data_ 903_904_ 061803" and "SWD&LIMS_dqa_qc_data_903_904_061803".

4.1.3 Accuracy

The following measures of accuracy were evaluated:

- Laboratory Control Sample Evaluation;
- Surrogate Evaluation;
- Blanks; and
- Sample Matrix Spike Evaluation.

Laboratory Control Sample Evaluation

The frequency of Laboratory Control Sample (LCS) measurements, relative to each laboratory batch, is given in Table 6. LCS frequency was adequate based on at least one LCS per lab batch. The minimum and maximum LCS results are tabulated by chemical and method for the project. Any qualifications of results due to LCS performance exceeding tolerance limits are captured in the V&V flags, described in the Completeness Section.

Surrogate Evaluation

The frequency of surrogate measurements is given in Table 7. Surrogate frequencies were adequate based on at least one surrogate set per sample. The minimum and maximum surrogate results are also tabulated, by chemical, for the project. Any qualifications of results due to surrogate results are captured in the V&V flags, described in the Completeness Section.

Blank Evaluation

Results of the field blank analyses are given in Table 8. Detectable amounts of contaminants within the field or laboratory blanks, which could indicate possible cross-contamination of samples, are evaluated if the same contaminant is detected in the associated real samples. None of the chemicals detected in blanks were detected at concentrations in real samples (where real sample concentrations exceeded Als), therefore no significant blank contamination is indicated.

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Table 6
Laboratory Control Summary

Test Method	CAS	Analyte	Min (%R)	Max (%R)	Number Analytes	Number Batches
SW-846 8260	630-20-6	1,1,1,2-Tetrachloroethane	89.3	132.8	8	8
SW-846 8260	71-55-6	1,1,1-Trichloroethane	76.9	102.6	8	8
SW-846 8260	79-34-5	1,1,2,2-Tetrachloroethane	86.9	124	8	8
SW-846 8260	76-13-1	1,1,2-Trichloro-1,2,2-Trifluoroethane	74.7	100.5	8	8
SW-846 8260	79-00-5	1,1,2-Trichloroethane	84.5	101.7	8	8
SW-846 8260	75-34-3	1,1-Dichloroethane	76.1	92.66	8	8
SW-846 8260	75-35-4	1,1-Dichloroethene	81.9	103.9	8	8
SW-846 8260	563-58-6	1,1-Dichloropropene	75.1	95.93	8	8
SW-846 8260	87-61-6	1,2,3-Trichlorobenzene	93.1	101.4	8	8
SW-846 8260	96-18-4	1,2,3-Trichloropropane	86.2	123.8	8	8
SW-846 8260	120-82-1	1,2,4-Trichlorobenzene	91.2	103.6	8	8
SW-846 8260	95-63-6	1,2,4-Trimethylbenzene	88.8	102.1	8	8
SW-846 8260	96-12-8	1,2-Dibromo-3-Chloropropane	79.1	100.8	8	8
SW-846 8260	106-93-4	1,2-Dibromoethane	83	96.26	8	8
SW-846 8260	95-50-1	1,2-Dichlorobenzene	92.9	102.2	8	8
SW-846 8260	107-06-2	1,2-Dichloroethane	76.6	91.81	8	8
SW-846 8260	17060-07-0	1,2-Dichloroethane-D4	97.6	107.5	8	8
SW-846 8260	78-87-5	1,2-Dichloropropane	85.1	113.5	8	8
SW-846 8260	108-67-8	1,3,5-Trimethylbenzene	91.2	105.5	8	8
SW-846 8260	142-28-9	1,3-Dichloropropane	85.6	99.64	8	8
SW-846 8260	106-46-7	1,4-Dichlorobenzene	92.3	102.4	8	8
SW-846 8260	594-20-7	2,2-Dichloropropane	76.3	99.21	8	8
SW-846 8260	78-93-3	2-Butanone	53.6	97.77	8	8
SW-846 8260	95-49-8	2-Chlorotoluene	90.4	102.4	8	8
SW-846 8260	591-78-6	2-Hexanone	67.8	97.5	8	8
SW-846 8260	460-00-4	4-Bromofluorobenzene	88.7	104.5	8	8
SW-846 8260	106-43-4	4-Chlorotoluene	91	102.6	8	8
SW-846 8260	99-87-6	4-Isopropyltoluene	93.8	110.3	8	8
SW-846 8260	108-10-1	4-Methyl-2-Pentanone	84.1	119.4	8	8
SW-846 8260	67-64-1	Acetone	41.1	86.34	8	8
SW-846 8260	71-43-2	Benzene	82.1	96.97	8	8
SW-846 8260	108-86-1	Bromobenzene	93.4	109.6	8	8
SW-846 8260	74-97-5	Bromochloromethane	80.6	94	8	8
SW-846 8260	75-27-4	Bromodichloromethane	88.3	113	8	8
SW-846 8260	75-25-2	Bromoform	91.2	128.4	8	8
SW-846 8260	74-83-9	Bromomethane	53.6	94.04	8	8
SW-846 8260	75-15-0	Carbon Disulfide	79.5	98.7	8	8
SW-846 8260	56-23-5	Carbon Tetrachloride	74.3	99.52	8	8
SW-846 8260	108-90-7	Chlorobenzene	91.2	136.2	8	8
SW-846 8260	75-00-3	Chloroethane	66.6	105.6	8	8
SW-846 8260	67-66-3	Chloroform	80	96.47	8	8

Test Method	CAS	Analyte	Min (%R)	Max (%R)	Number Analytes	Number Batches
SW-846 8260	74-87-3	Chloromethane	53.3	82.93	8	8
SW-846 8260	156-59-2	Cis-1,2-Dichloroethene	80.7	96.9	8	8
SW-846 8260	10061-01-5	Cis-1,3-Dichloropropene	67.3	80.35	8	8
SW9010/SW9012	57-12-5	Cyanide	93	102	8	8
SW-846 8260	124-48-1	Dibromochloromethane	87.6	97.69	8	8
SW-846 8260	74-95-3	Dibromomethane	89.9	111	8	8
SW-846 8260	75-71-8	Dichlorodifluoromethane	43.7	95.6	8	8
SW-846 8260	100-41-4	Ethylbenzene	89.7	122.3	8	8
SW-846 8260	87-68-3	Hexachlorobutadiene	84.2	103.8	8	8
SW-846 8260	98-82-8	Isopropylbenzene	94.7	112.9	8	8
SW-846 8260	541-73-1	M-Dichlorobenzene	92.2	102.7	8	8
SW-846 8260	75-09-2	Methylene Chloride	80.7	95.26	8	8
SW-846 8260	91-20-3	Naphthalene	96.7	108.8	8	8
SW-846 8260	104-51-8	N-Butylbenzene	89.9	106.5	8	8
SW9056 OR E300.0 PREP E300.0	14797-55-8	Nitrate	96	101	12	12
SW-846 8260	103-65-1	N-Propylbenzene	89.8	103.3	8	8
SW-846 8260	135-98-8	Sec-Butylbenzene	88.4	102.9	8	8
SW-846 8260	100-42-5	Styrene	90.1	102.2	8	8
SW-846 8260	98-06-6	Tert-Butylbenzene	92.4	106.7	8	8
SW-846 8260	127-18-4	Tetrachloroethene	88.1	101.9	8	8
SW-846 8260	108-88-3	Toluene	90.8	104.9	8	8
SW-846 8260	2037-26-5	Toluene-D8	83.8	104.9	8	8
SW-846 8260	156-60-5	Trans-1,2-Dichloroethene	82	101.9	8	8
SW-846 8260	10061-02-6	Trans-1,3-Dichloropropene	89.4	105.2	8	8
SW-846 8260	79-01-6	Trichloroethene	81.2	106.5	8	8
SW-846 8260	75-69-4	Trichlorofluoromethane	75.1	109.3	8	8
SW-846 8260	75-01-4	Vinyl Chloride	69.3	102	8	8
SW-846 8260	1330-20-7	Xylene	90.5	102.9	8	8

Table 7
Surrogate Recovery Summary

Number Samples	Analyte	Minimum (%R)	Maximum (%R)
58	1,2-Dichloroethane-D4	87.04	119.2
58	4-Bromofluorobenzene	87.04	130.5
58	Toluene-D8	85.19	110.9

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Table 8
Blank Summary

Test Method	CAS No.	Analyte	Maximum	Unit	Number Lab Samples	Number Lab Batches
SW8260	67-64-1	ACETONE	60	UG/KG	7	7
SW9010/9012	57-12-5	CYANIDE, TOTAL	0.16	MG/KG	2	2
SW8260	108-10-1	4-METHYL-2-PENTANONE	8	UG/KG	2	2
SW8260	91-20-3	NAPHTHALENE	2	UG/KG	5	5
SW9056 or E300	14797-55-8	NITRATE AS N	2.2	MG/KG	4	4
SW8260	127-18-4	TETRACHLOROETHENE	2	UG/KG	1	1
SW8260	67-64-1	ACETONE	10	UG/KG	Field Blank	NA

Sample Matrix Spike Evaluation

The frequency of MS measurements was adequate based on at least one MS per lab batch. The minimum and maximum MS results are summarized by chemical for the entire project in Table 9. MS recoveries alone do not result in rejection of data. Qualifications due to matrix spike performance are included in the V&V flags summarized in the Completeness Section.

Table 9
Sample Matrix Spike Evaluation

Test Method	CAS No.	Analyte	Min (%R)	Max (%R)	Number Samples	Number Lab Batches
SW-846 8260	71-55-6	1,1,1-TRICHLOROETHANE	78.32	99.36	6	6
SW-846 8260	79-34-5	1,1,2,2-TETRACHLOROETHANE	64.46	99.13	6	6
SW-846 8260	79-00-5	1,1,2-TRICHLOROETHANE	76.7	98.22	6	6
SW-846 8260	75-34-3	1,1-DICHLOROETHANE	87.09	98.57	6	6
SW-846 8260	75-35-4	1,1-DICHLOROETHENE	82.32	88.15	6	6
SW-846 8260	120-82-1	1,2,4-TRICHLOROBENZENE	22.93	66.57	6	6
SW-846 8260	107-06-2	1,2-DICHLOROETHANE	82.95	108.1	6	6
SW-846 8260	78-87-5	1,2-DICHLOROPROPANE	80.66	101.6	6	6
SW-846 8260	78-93-3	2-BUTANONE	96.15	140.4	6	6
SW-846 8260	108-10-1	4-METHYL-2-PENTANONE	62.39	94.8	6	6
SW-846 8260	67-64-1	ACETONE	105.1	156.3	6	6
SW-846 6010	7429-90-5	ALUMINUM	97	99	3	3
SW-846 6010	7440-36-0	ANTIMONY	94	101	3	3
SW-846 6010	7440-38-2	ARSENIC	96	103	3	3
SW-846 6010	7440-39-3	BARIUM	99	105	3	3
SW-846 8260	71-43-2	BENZENE	79	96.24	6	6
SW-846 6010	7440-41-7	BERYLLIUM	99	106	3	3
SW-846 8260	75-27-4	BROMODICHLOROMETHANE	74.37	96.8	6	6
SW-846 8260	75-25-2	BROMOFORM	61.04	103.4	6	6
SW-846 8260	74-83-9	BROMOMETHANE	81.21	94.33	6	6

Test Method	CAS No.	Analyte	Min (%R)	Max (%R)	Number Samples	Number Lab Batches
SW-846 6010	7440-43-9	CADMIUM	97	105	3	3
SW-846 8260	75-15-0	CARBON DISULFIDE	77.47	88.91	6	6
SW-846 8260	56-23-5	CARBON TETRACHLORIDE	78.89	98.77	6	6
SW-846 8260	108-90-7	CHLOROBENZENE	63.65	97.87	6	6
SW-846 8260	75-00-3	CHLOROETHANE	75.94	89.22	6	6
SW-846 8260	67-66-3	CHLOROFORM	79.58	97.6	6	6
SW-846 8260	74-87-3	CHLOROMETHANE	90.47	120.7	6	6
SW-846 8260	10061-01-5	CIS-1,3-DICHLOROPROPENE	86.65	125.8	6	6
SW-846 6010	7440-48-4	COBALT	96	103	3	3
SW-846 6010	7440-50-8	COPPER	95	101	3	3
E335.3, E335.4, SM4500	57-12-5	CYANIDE, TOTAL	94	98	3	3
SW9010B OR SW9012A	57-12-5	CYANIDE, TOTAL	87	98	6	6
SW-846 8260	124-48-1	DIBROMOCHLOROMETHANE	65.37	93.73	6	6
SW-846 8260	100-41-4	ETHYLBENZENE	67.46	93.62	6	6
SW-846 8260	87-68-3	HEXACHLOROBUTADIENE	27.58	68.09	6	6
SW-846 6010	7439-89-6	IRON	101	103	3	3
SW-846 6010	7439-92-1	LEAD	98	105	3	3
SW-846 6010	7439-93-2	LITHIUM	102	104	3	3
SW-846 6010	7439-96-5	MANGANESE	97	104	3	3
SW-846 6010	7439-97-6	MERCURY	95	99	3	3
SW-846 8260	75-09-2	METHYLENE CHLORIDE	82.82	93.91	6	6
SW-846 6010	7439-98-7	MOLYBDENUM	97	102	3	3
SW-846 8260	91-20-3	NAPHTHALENE	23.63	70.04	6	6
SW-846 6010	7440-02-0	NICKEL	96	105	3	3
SW9056 OR E300.0	14797-55-8	NITRATE AS N	86	111	2	2
SW9056 OR E300.0 PREP E300.0	14797-55-8	NITRATE AS N	79	95	4	4
SW-846 8260	95-50-1	O-DICHLOROBENZENE	38.32	81.26	6	6
SW-846 8260	106-46-7	P-DICHLOROBENZENE	40	80.92	6	6
SW-846 6010	7782-49-2	SELENIUM	93	102	3	3
SW-846 6010	7440-22-4	SILVER	100	103	3	3
SW-846 6010	7440-24-6	STRONTIUM	99	105	3	3
SW-846 8260	100-42-5	STYRENE	58.37	91.16	6	6
SW-846 8260	127-18-4	TETRACHLOROETHENE	67.09	86.7	6	6
SW-846 6010	7440-31-5	TIN	95	100	3	3
SW-846 8260	108-88-3	TOLUENE	72.37	90.4	6	6
SW-846 8260	10061-02-6	TRANS-1,3-DICHLOROPROPENE	66.07	91.85	6	6
SW-846 8260	79-01-6	TRICHLOROETHENE	77.75	99.26	6	6
SW-846 6010	7440-62-2	VANADIUM	99	104	3	3
SW-846 8260	75-01-4	VINYL CHLORIDE	74.21	97.3	6	6
SW-846 8260	1330-20-7	XYLENES (TOTAL)	66.5188	86.7563	6	6

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Test Method	CAS No.	Analyte	Min (%R)	Max (%R)	Number Samples	Number Lab Batches
SW-846 6010	7440-66-6	ZINC	94	98	3	3

4.1.4 Precision

Matrix Spike Duplicate Evaluation

Table 10 lists the maximum relative percent differences (RPDs). Laboratory precision may be measured through use of the MSD. The frequency of MSD measurements was adequate based on at least one MS per lab batch (Table 11). Repeatability of matrix spike recoveries is adequate if less than 35% (RPD); however, relative percent differences (RPDs) exceeding 35 percent do not affect project decisions because all related real sample results were repeatable well below ALs.

Table 10
Sample Matrix Spike Duplicate Evaluation

Test Method	CAS No.	Analyte	Number Sample Pairs	Number Lab Batches	Maximum RPD (%)
SW-846 8260	71-55-6	1,1,1-TRICHLOROETHANE	6	6	7
SW-846 8260	79-34-5	1,1,2,2-TETRACHLOROETHANE	6	6	7
SW-846 8260	79-00-5	1,1,2-TRICHLOROETHANE	6	6	9
SW-846 8260	75-34-3	1,1-DICHLOROETHANE	6	6	7
SW-846 8260	75-35-4	1,1-DICHLOROETHENE	6	6	6
SW-846 8260	120-82-1	1,2,4-TRICHLOROBENZENE	6	6	48
SW-846 8260	107-06-2	1,2-DICHLOROETHANE	6	6	8
SW-846 8260	78-87-5	1,2-DICHLOROPROPANE	6	6	7
SW-846 8260	78-93-3	2-BUTANONE	6	6	11
SW-846 8260	108-10-1	4-METHYL-2-PENTANONE	6	6	7
SW-846 8260	67-64-1	ACETONE	6	6	26
SW-846 6010	7429-90-5	ALUMINUM	3	3	1
SW-846 6010	7440-36-0	ANTIMONY	3	3	1
SW-846 6010	7440-38-2	ARSENIC	3	3	1
SW-846 6010	7440-39-3	BARIUM	3	3	1
SW-846 8260	71-43-2	BENZENE	6	6	9
SW-846 6010	7440-41-7	BERYLLIUM	3	3	2
SW-846 8260	75-27-4	BROMODICHLOROMETHANE	6	6	9
SW-846 8260	75-25-2	BROMOFORM	6	6	20
SW-846 8260	74-83-9	BROMOMETHANE	6	6	16
SW-846 6010	7440-43-9	CADMIUM	3	3	3
SW-846 8260	75-15-0	CARBON DISULFIDE	6	6	7
SW-846 8260	56-23-5	CARBON TETRACHLORIDE	6	6	7
SW-846 8260	108-90-7	CHLOROBENZENE	6	6	11
SW-846 8260	75-00-3	CHLOROETHANE	6	6	17
SW-846 8260	67-66-3	CHLOROFORM	6	6	9
SW-846 8260	74-87-3	CHLOROMETHANE	6	6	15

Test Method	CAS No.	Analyte	Number Sample Pairs	Number Lab Batches	Maximum RPD (%)
SW-846 8260	10061-01-5	CIS-1,3-DICHLOROPROPENE	6	6	12
SW-846 6010	7440-48-4	COBALT	3	3	1
SW-846 6010	7440-50-8	COPPER	3	3	1
E335/SM4500	57-12-5	CYANIDE, TOTAL	3	3	6
SW9010B OR SW9012A	57-12-5	CYANIDE, TOTAL	6	6	2
SW-846 8260	124-48-1	DIBROMOCHLOROMETHANE	6	6	9
SW-846 8260	100-41-4	ETHYLBENZENE	6	6	12
SW-846 8260	87-68-3	HEXACHLOROBUTADIENE	6	6	30
SW-846 6010	7439-89-6	IRON	3	3	3
SW-846 6010	7439-92-1	LEAD	3	3	1
SW-846 6010	7439-93-2	LITHIUM	3	3	2
SW-846 6010	7439-96-5	MANGANESE	3	3	2
SW-846 6010	7439-97-6	MERCURY	3	3	3
SW-846 8260	75-09-2	METHYLENE CHLORIDE	6	6	8
SW-846 6010	7439-98-7	MOLYBDENUM	3	3	1
SW-846 8260	91-20-3	NAPHTHALENE	6	6	53
SW-846 6010	7440-02-0	NICKEL	3	3	1
SW9056/E300	14797-55-8	NITRATE AS N	4	4	6
SW9056 OR E300.0	14797-55-8	NITRATE AS N	2	2	18
SW-846 8260	95-50-1	O-DICHLOROBENZENE	6	6	34
SW-846 8260	106-46-7	P-DICHLOROBENZENE	6	6	32
SW-846 6010	7782-49-2	SELENIUM	3	3	2
SW-846 6010	7440-22-4	SILVER	3	3	1
SW-846 6010	7440-24-6	STRONTIUM	3	3	1
SW-846 8260	100-42-5	STYRENE	6	6	27
SW-846 8260	127-18-4	TETRACHLOROETHENE	6	6	11
SW-846 6010	7440-31-5	TIN	3	3	2
SW-846 8260	108-88-3	TOLUENE	6	6	9
SW-846 8260	10061-02-6	TRANS-1,3-DICHLOROPROPENE	6	6	12
SW-846 8260	79-01-6	TRICHLOROETHENE	6	6	9
SW-846 6010	7440-62-2	VANADIUM	3	3	1
SW-846 8260	75-01-4	VINYL CHLORIDE	6	6	14
SW-846 8260	1330-20-7	XYLENES (TOTAL)	6	6	16
SW-846 6010	7440-66-6	ZINC	3	3	1

Field Duplicate Evaluation

Field duplicate results reflect sampling precision, or overall repeatability of the sampling process. The frequency of field duplicate collection should exceed 1 field duplicate per 20 real samples, or 5 percent. Table 11 indicates that duplicate sampling frequencies were adequate for all analytical suites.

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A common metric for evaluating precision is the RPD value; RPD values are given in Table 12. Ideally, RPDs of less than 35 percent (in soil) indicate satisfactory precision. Values exceeding 35 percent only affect project decisions if the imprecision is great enough to cause contradictory decisions relative to the COC (i.e., one sample indicates clean soil whereas the QC partner does not). Analytes exceeding 35% RPD and consistently below their respective ALs are repeatable at concentrations below ALs, which does not impact project decisions. If contaminant concentrations exceeded the AL level (e.g., lead), and also exceeded the 35% RPD value, then all associated results were reviewed to determine if the magnitude of imprecision could impact project decisions (i.e., could some of those sample concentrations measured below ALs possibly exceed ALs?).

The maximum RPD for lead was 41%. Lead's concentration ranged up to a 52% difference between a real sample and its field duplicate (41% RPD). Given this sampling precision, all real samples exceeding 17 mg/kg are qualified with a potential low bias, where the true lead concentration could exceed the ERAL, 25.6 mg/kg, because of sampling process variability.

Table 11
Field Duplicate Sample Frequency

Test Method	Number Real Samples	Number Duplicate Samples	Collection Frequency (%)
Rads - Gamma Spec	43	3	7%
SW6200 (Metals-XRF)	43	3	7%
SW8260 (VOC)	43	3	7%
SW9010/9012 (Cyanide)	43	3	7%
SW9056 or E300 (Anions)	43	2	5%

Table 12
Field Duplicate Results

Analyte	Maximum RPD
1,1,1-TRICHLOROETHANE	3
1,1,2,2-TETRACHLOROETHANE	3
1,1,2-TRICHLOROETHANE	3
1,1-DICHLOROETHANE	4
1,1-DICHLOROETHENE	3
1,2,4-TRICHLOROBENZENE	3
1,2-DICHLOROETHANE	3
1,2-DICHLOROPROPANE	3
2-BUTANONE	4
4-METHYL-2-PENTANONE	3
ACETONE	3
ANTIMONY	0
ARSENIC	21
BARIUM	16
BENZENE	3

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Analyte	Maximum RPD
BROMODICHLOROMETHANE	3
BROMOFORM	3
BROMOMETHANE	3
CARBON DISULFIDE	3
CARBON TETRACHLORIDE	3
CHLOROBENZENE	4
CHLOROETHANE	3
CHLOROFORM	3
CHLOROMETHANE	3
CIS-1,3-DICHLOROPROPENE	3
COBALT	1
COPPER	76
DIBROMOCHLOROMETHANE	3
ETHYLBENZENE	4
HEXACHLOROBUTADIENE	3
IRON	4
LEAD	41
MANGANESE	13
METHYLENE CHLORIDE	3
MOLYBDENUM	0
NAPHTHALENE	19
NICKEL	5
SELENIUM	0
SILVER	0
STRONTIUM	4
TETRACHLOROETHENE	3
TIN	42
TOLUENE	4
TRANS-1,3-DICHLOROPROPENE	3
TRICHLOROETHENE	3
VANADIUM	22
VINYL CHLORIDE	3
ZINC	13

Completeness

The required number of samples were collected in accordance with the approved and controlled IASAP Addendum #IA-03-01 (DOE, 2002a). Based on this compliance, and an adequate percentage of validated sample results as explained below, the sample set is considered complete.

Twenty-five percent of the Environmental Restoration (ER) Program's analytical results are targeted for formal validation. Of that percentage, no more than 10 percent of the

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results may be rejected, which ensures that analytical laboratory practices are consistent with quality requirements. Table 13 shows the number of validated records (codes without "1"), verified records (codes with "1"), and rejected records for each analytical group.

The "Validation" percentages given in Table 13 alone, do not indicate frequency goals were attained for any analytical suites. However, spot checks on flags applied to radionuclide gamma spectroscopy results *in* hardcopy data packages indicate at least a 25% frequency, however those flags have not yet been uploaded to the RFETS SWD. Other analytical suites were 100% verified.

Because the frequency of validation is within project quality requirements and in compliance with the RFETS validation goal of 25% of all analytical records, the results indicate that these data are adequate.

If additional V&V information is received, IHSS Group 900-3 records will be updated in the Soil and Water Database. Frequency of data qualification and inferences from it will also be assessed as part of the Comprehensive Risk Assessment.

4.1.5 Sensitivity

Reporting limits, in units of ug/kg for organics, mg/kg for metals, and pCi/g for radionuclides, were compared with RFCA WRW and ERALs. Adequate sensitivities of analytical methods were attained for all COCs that affect project decisions. Adequate sensitivity is defined as a reporting limit less than an analyte's associated AL, typically less than one-half the AL.

4.1.6 Summary of Data Quality

Data quality is acceptable for project decisions based on the V&V criteria cited and with the qualifications given.

Table 13
Validation and Verification Summary

Qualifier Code	Number Records	Radionuclides (Gamma Spec)	Metals-XRF (SW6200)	VOCs (SW8260)	Cyanide (SW9010/9012)	Anions (SW9056/E300)
No V&V	3440	688	0	2752	0	0
J	10	0	10	0	0	0
J1	72	0	62	0	0	10
R1	2	0	0	0	0	2
V	108	0	108	0	0	0
V1	685	0	663	0	22	0
UJ	2	0	2	0	0	0
UJ1	67	0	15	0	21	31
Total	4386	688	860	2752	43	43
Total Validated	118	0	118	0	0	0
% Validated	3%	0%	14%	0%	0%	0%
Total Verified	946	0	860	0	43	43
% Verified	22%	0%	100%	0%	100%	100%
% Rejected	0.05%	0.00%	0.00%	0.00%	0.00%	4.65%

Key:
1,V1 – Verified
J, J1 - Estimated
UJ1 - Estimated detection limit
V – Validated
R, R1 - Rejected

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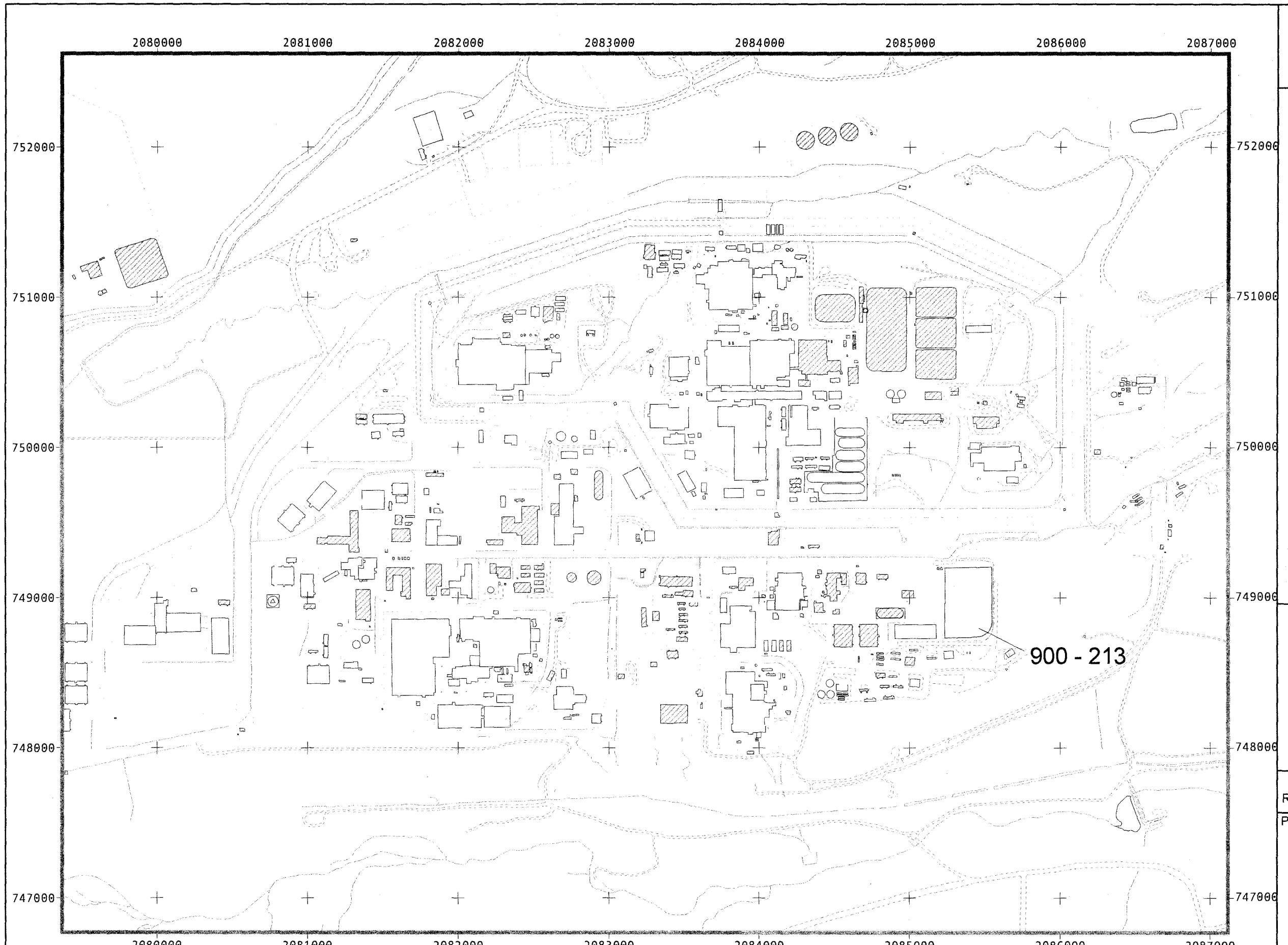

Figure 1

IHSS Group 900-3 Location Map

Key

- Streams
- Fence
- IHSS Group 900-3
- Dirt Road
- Paved Area

Building

- Demolished
- Standing

N

W E

S

500 0 500 Feet

Scale = 1:10,000

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by: Date: July 2003

RADMS
REMEDIAL ACTION DECISION MANAGEMENT SYSTEM

KAISER•HILL
COMPANY

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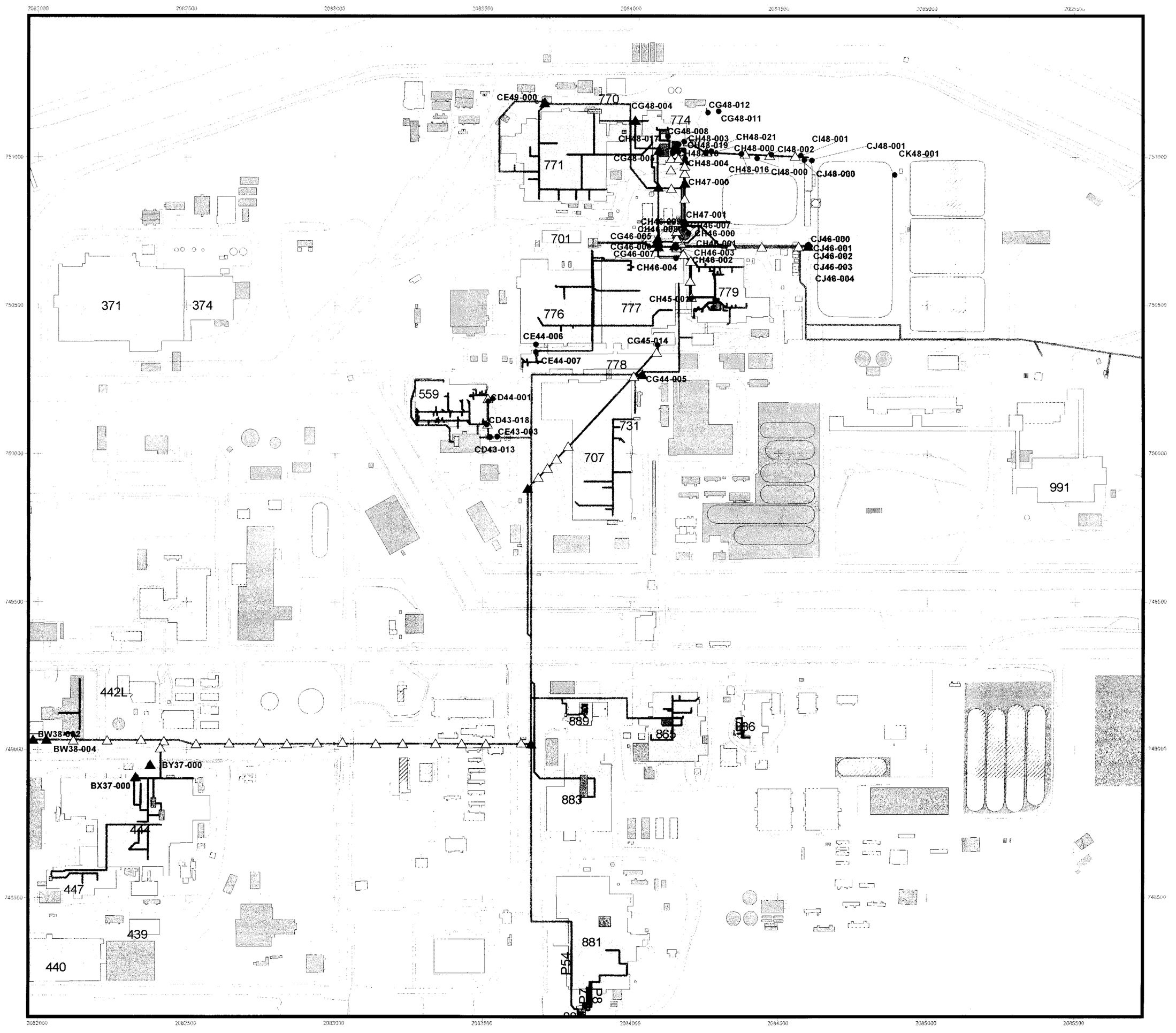
Figure 4
IHSS Group 000-2
Existing Sampling Locations



KEY

- UBC
- OPWL Tank
- OPWL
- Paved area
- Dirt road
- Stream, ditch, or drainage
- ▲ Known Leak Location
- △ Suspected Leak Location
- ● Existing OPWL sampling location

Building

- Demolished
- Standing

N

100 0 100 200 300 Feet

Scale 1: 3,000

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by:

RADMS

Prepared for:

KAISER•HILL COMPANY

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September 2003